The PHOTOFACT Servicer

SET 452 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ AUGUST 1959

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

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Pentron Model CA-11

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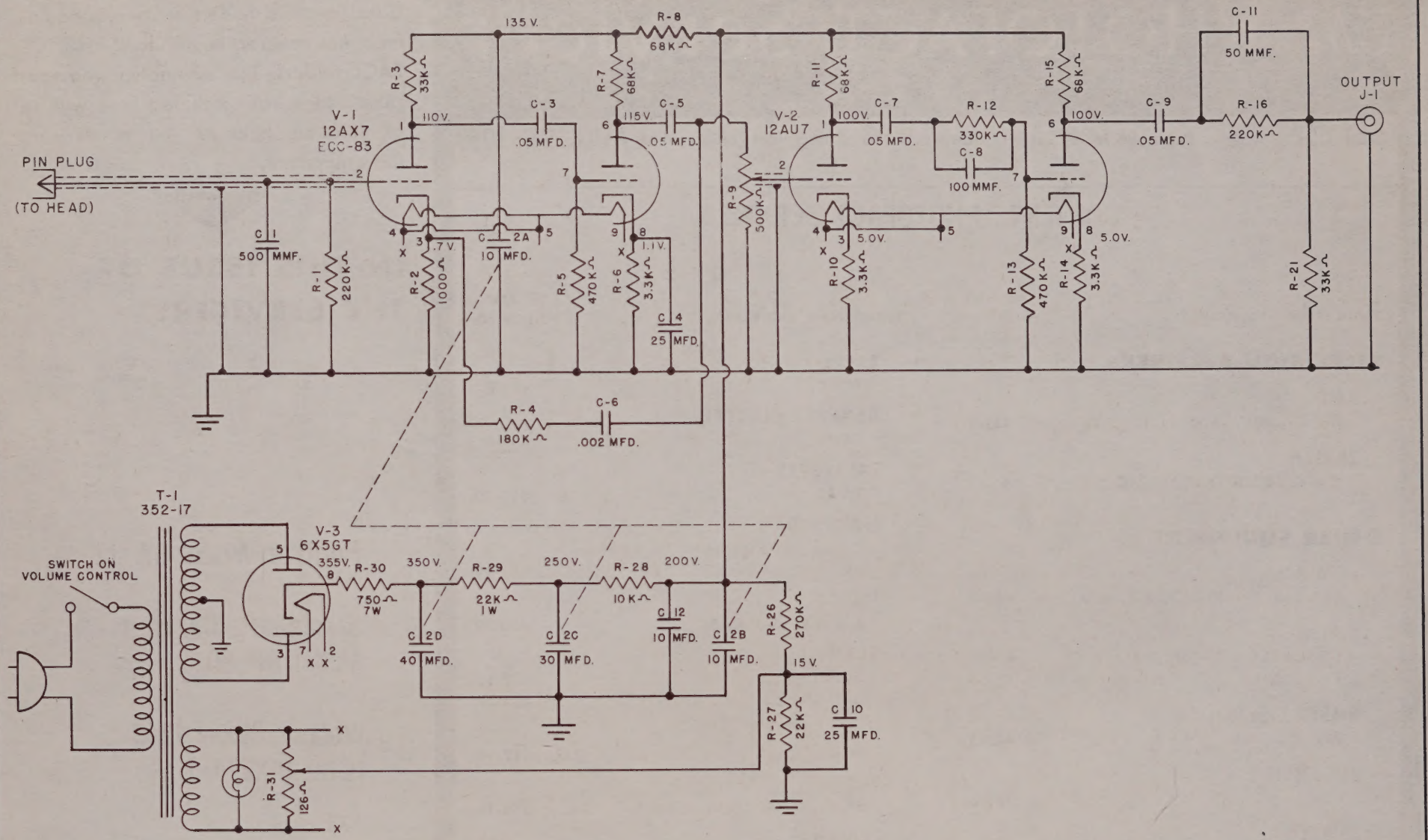
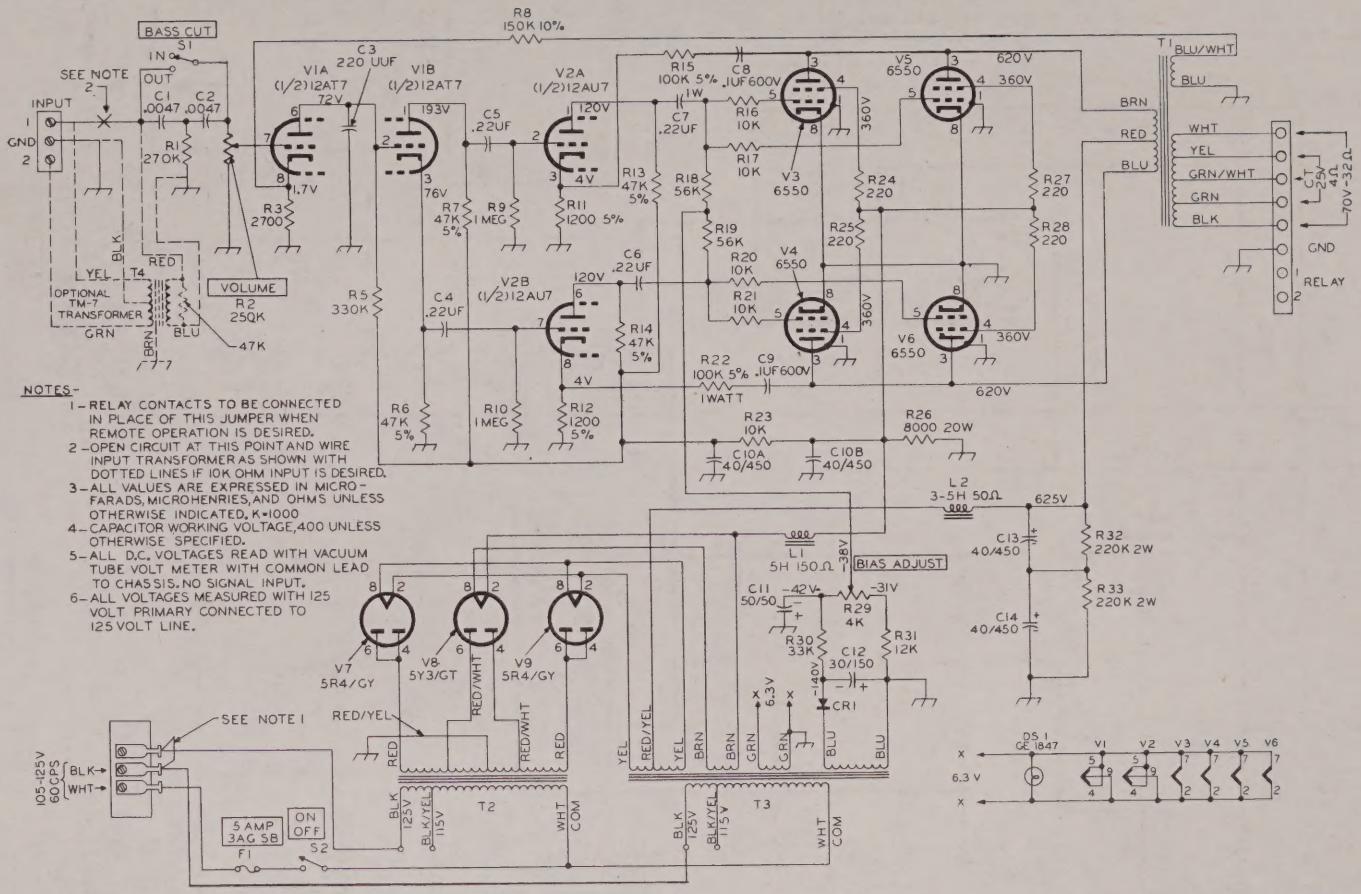


PENTRON MODEL CA-11

Schematic Diagram Courtesy of Pentron Corp.

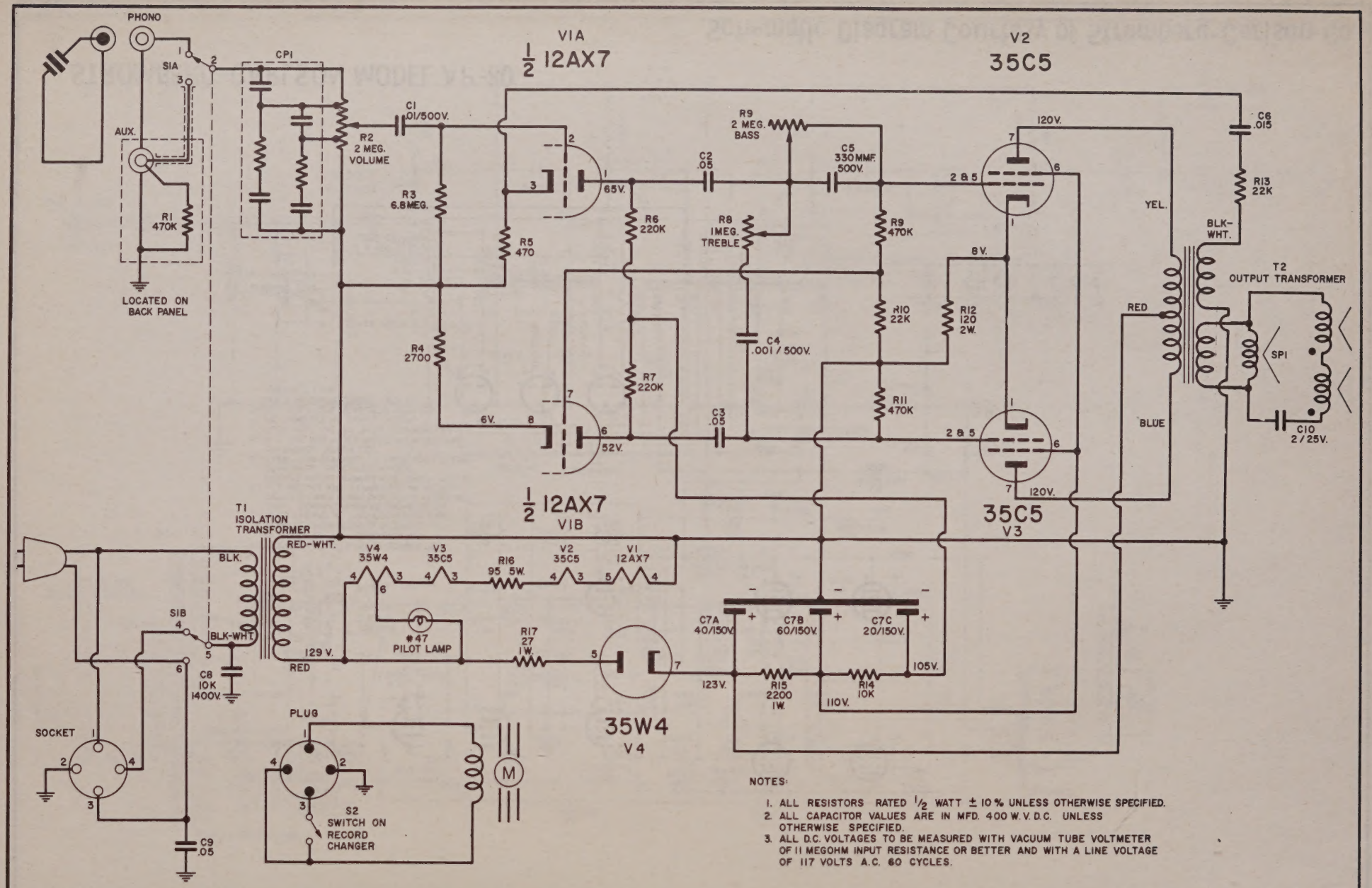


NOTES-

1 - RELAY CONTACTS TO BE CONNECTED IN PLACE OF THIS JUMPER WHEN REMOTE OPERATION IS DESIRED.
2 - OPEN CIRCUIT AT THIS POINT AND WIRE INPUT TRANSFORMER AS SHOWN WITH DOTTED LINES IF 10K OHM INPUT IS DESIRED.
3 - ALL VALUES ARE EXPRESSED IN MICRO-FARADS, MICROHENRIES, AND OHMS UNLESS OTHERWISE INDICATED. K=1000
4 - CAPACITOR WORKING VOLTAGE, 400 UNLESS OTHERWISE SPECIFIED.
5 - ALL D.C. VOLTAGES READ WITH VACUUM TUBE VOLT METER WITH COMMON LEAD TO CHASSIS. NO SIGNAL INPUT.
6 - ALL VOLTAGES MEASURED WITH 125 VOLT PRIMARY CONNECTED TO 125 VOLT LINE.

STROMBERG-CARLSON MODEL AP-80

Schematic Diagram Courtesy of Stromberg-Carlson Co.



NOTES:

1. ALL RESISTORS RATED 1/2 WATT ± 10% UNLESS OTHERWISE SPECIFIED.
2. ALL CAPACITOR VALUES ARE IN MFD. 400 W.V.D.C. UNLESS OTHERWISE SPECIFIED.
3. ALL D.C. VOLTAGES TO BE MEASURED WITH VACUUM TUBE VOLTMETER OF 11 MEGOHM INPUT RESISTANCE OR BETTER AND WITH A LINE VOLTAGE OF 117 VOLTS A.C. 60 CYCLES.

WEBCOR MODEL 1863 (CH. 14X274-1)

Schematic Diagram Courtesy of Webcor, Inc.

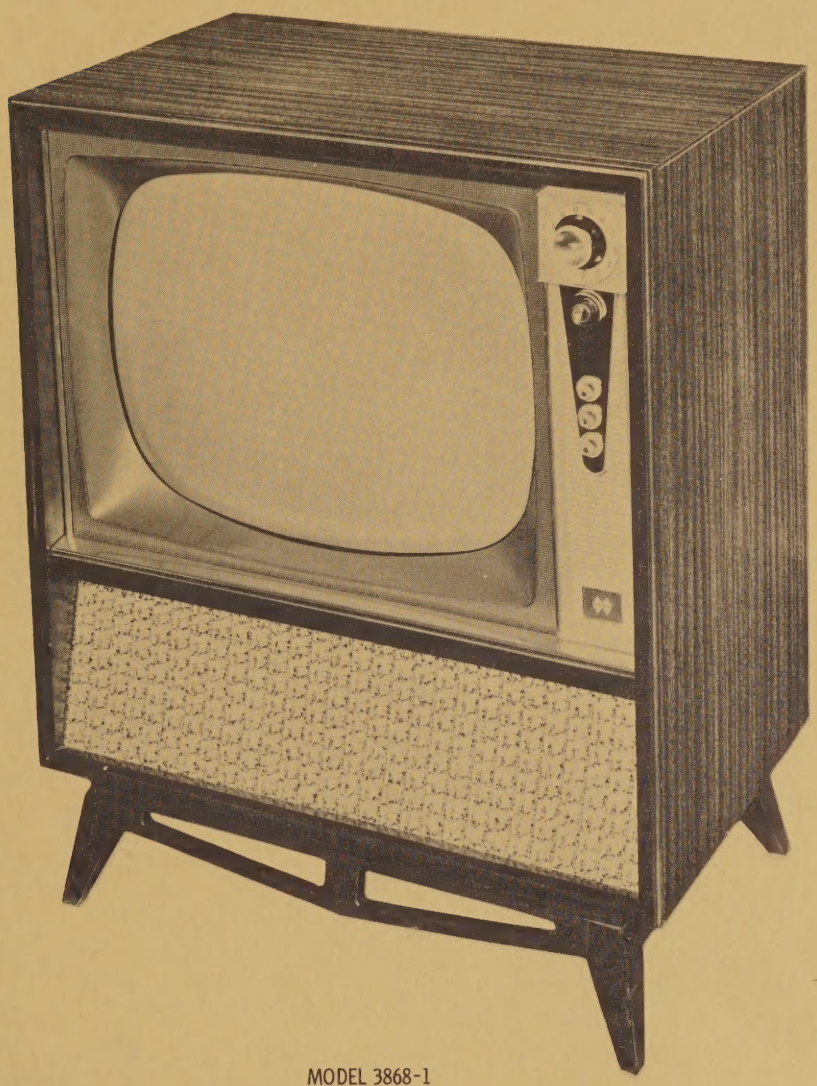
PHOTOFACT* Folder

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

AMC MODELS 3868-1, -UHF,
3870-1, -UHF, 3898-1, -UHF



MODEL 3868-1

AMC MODELS 3868-1, -UHF,
3870-1, -UHF, 3898-1, -UHF

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SET 452 FOLDER 1

PHOTOFACT* Folder

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type knobs.
2. Remove 6 wood screws holding rear cover. Remove the rear cover.
3. Remove speaker leads.
4. Remove 2 screws holding antenna terminal board.
5. Remove 2 wood screws holding top chassis braces.
6. On models having side mounted controls, remove 1 hex screw holding bracket to cabinet and hex screw painted red near Vertical Output transformer holding control panel. Swing control panel back into cabinet to clear shafts.
7. Remove 4 bottom chassis bolts.
8. Remove chassis.

SEE PICTURE TUBE REMOVAL PAGE 16

MODEL 3868-1

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	AMC MODELS 3868-1, -UHF, 3870-1, -UHF, 3898-1, -UHF
SUPPLIER	Associated Merchandising Corp., 1440 Broadway, New York 14, N. Y.
TYPE SET	Television Receiver
TUBES	VHF-Fourteen, UHF-Fifteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 160 Watts, 1.45 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENT

For touch-up adjustment of the VHF Oscillator, it is necessary to remove the chassis from the cabinet. (See disassembly instructions.)

SAFETY GLASS REMOVAL

Remove 5 wood screws holding metal trim strip at top of safety glass. Tilt top of glass out and lift up to remove.

RANGE CONTROL

Observe the picture and advance the Range control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

FOCUS

No provision is made to vary the focus on this receiver. (Some sets may be equipped with a Beam Alignment Magnet which may be adjusted for best focus.)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horizontal Oscillator, it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see tube placement chart.)

FUSE DEVICE

A 7.5Ω fusible resistor (R64) is used for low voltage power supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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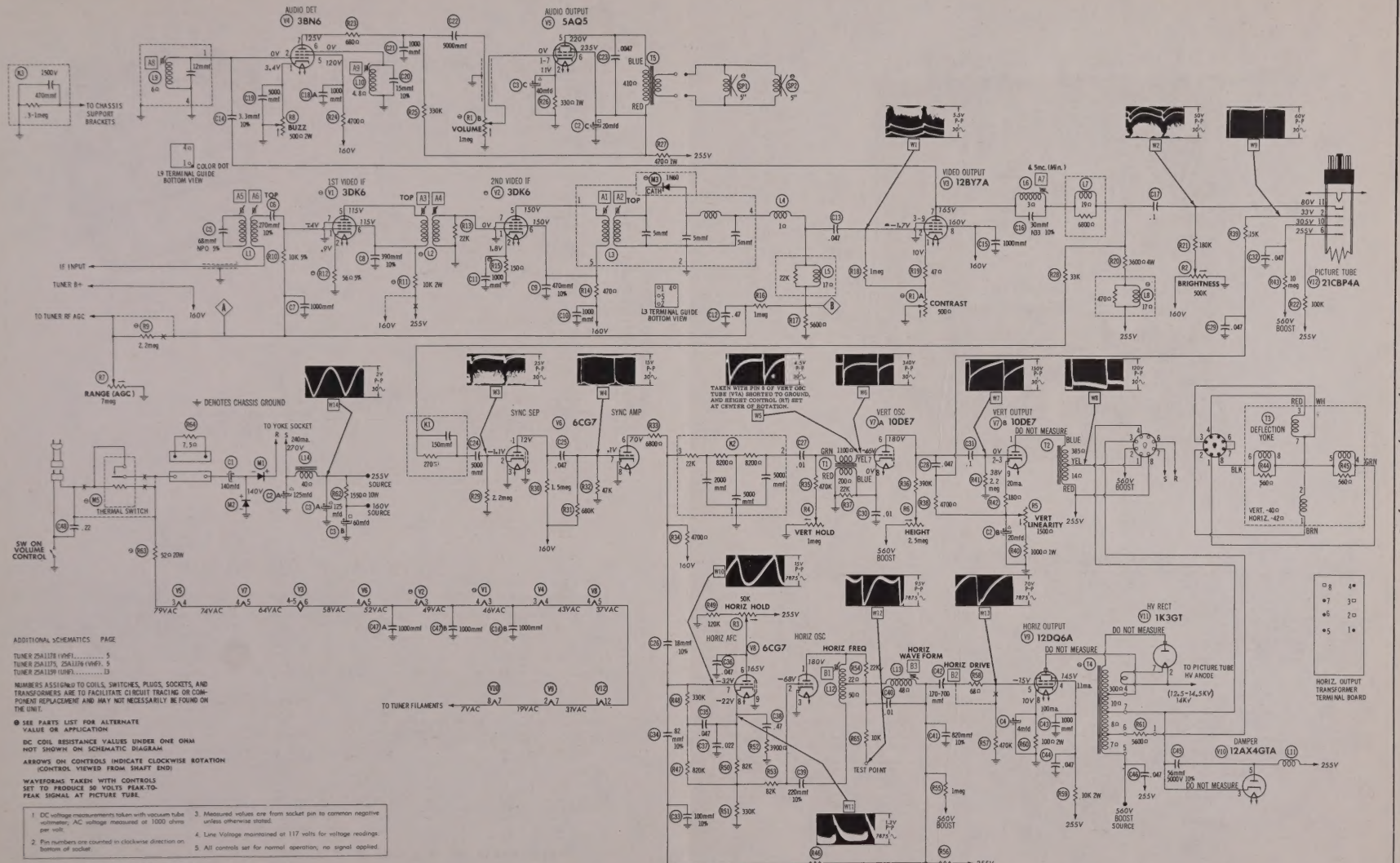
J109R

AMC MODELS 3868-1, -UHF, 3870-1, -UHF, 3898-1, -UHF
AMC MODELS 3868-1, -UHF, 3870-1, -UHF, 3898-1, -UHF
SET 452 FOLDER 1



ADDITIONAL SCHEMATICS PAGE

TUNER 25A1178 (VHF)..... 5
TUNER 25A1175, 25A1176 (VHF). 5
TUNER 25A1159 (UHF)..... 13

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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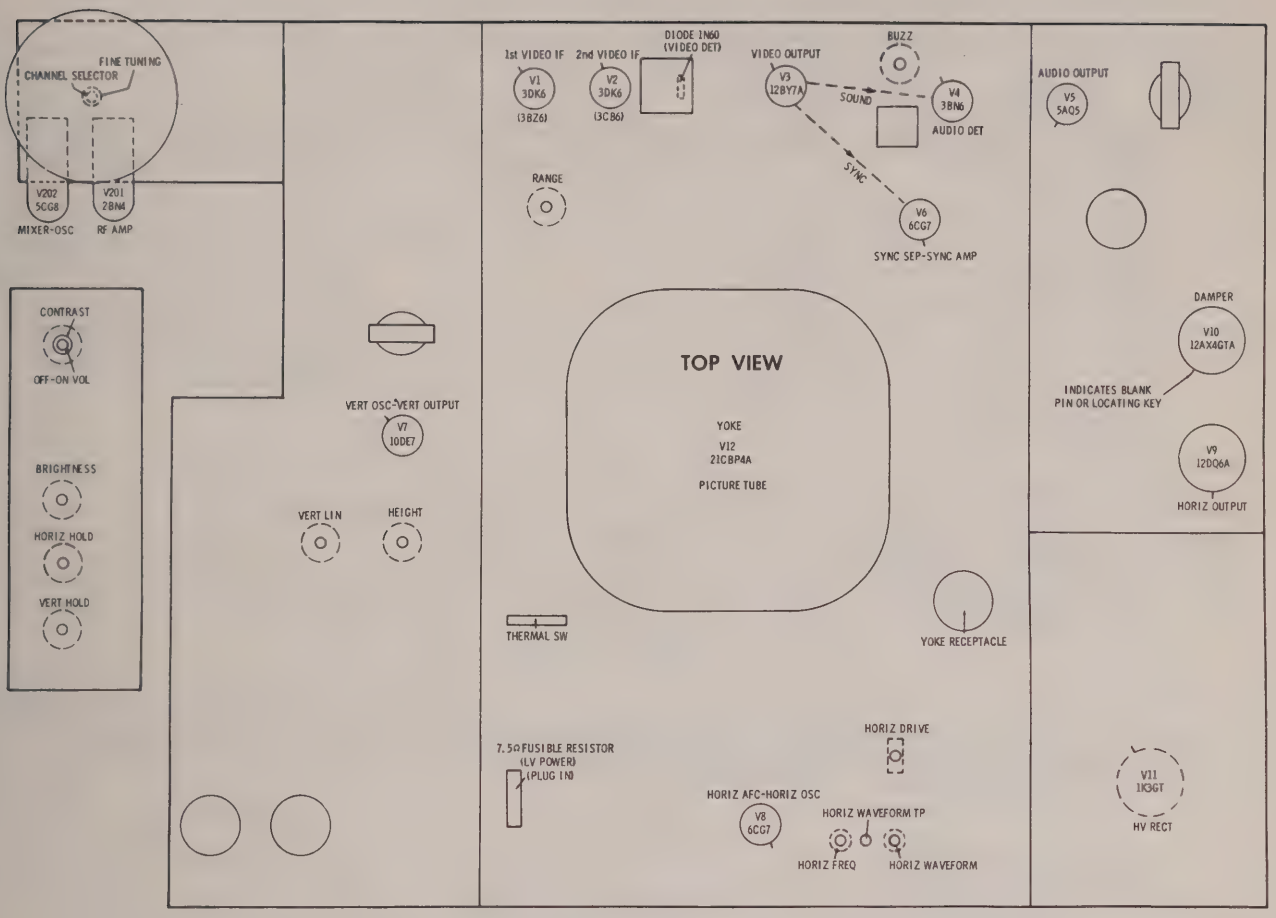
TUBE PLACEMENT CHART



AMC MODELS 3868-1, -UHF, 3870-1, -UHF, 3898-1, -UHF

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

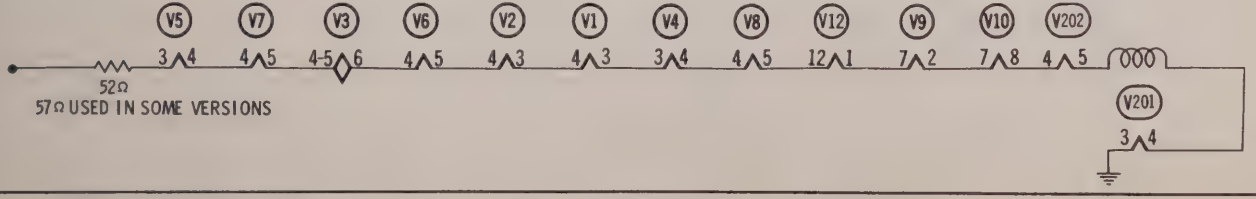
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (7.5Ω), Rectifier (B+)

SWEEP FAILURE
No raster, has sound V8, V9, V10, V11, V12, Rectifier (B+)
No vertical deflection V7
Poor vert. linearity or foldover V7
Poor horiz. linearity or foldover V8, V9, V10
Narrow picture V8, V9, V10, Rectifier (B+)
Vert. off freq. V7
Horiz. off freq. V8

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V12
Has pic, no sound V4, V5

SYNC FAILURE
No vert. sync V6
No horiz. sync V6, V8
No vert. or horiz. sync V6

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



FOLDER 1

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 7 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.01mfd	High side to pin 1 (grid) of 2nd Video IF. Low side to chassis. Adjust output for 4VP-P on scope.	44.0MC (10MC Swp)	42.4MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 47K to point (B). Low side to chassis. (Across Video Det. load)	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. A1 controls marker position and A2 controls gain and symmetry.
2.	"	High side to pin 1 (grid) of 1st Video IF. Low side to chassis. Adjust for 4VP-P on scope.	"	42.4MC 43.5MC 44.5MC 45.75MC	"	"	A3, A4	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. A3 controls marker position and A4 controls gain and symmetry.
3.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	41.25MC 42.4MC 43.5MC 44.5MC 45.75MC	"	"	A5, A6, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. Adjust A5 to place 41.25MC marker in trap notch.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.01mfd	High side to pin 2 (grid) of Video Output. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	AC probe to pin 11 (cathode) of picture tube. Common to chassis. Use 0-10V AC scale.	A7	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV station and reduce the signal strength at the antenna terminals until a hiss is heard in the sound similar to super-regeneration.
Adjust A8, A9 and the Buzz control (R8) for maximum undistorted sound with MINIMUM buzz.
If the hiss disappears during adjusting, further reduce the signal strength.

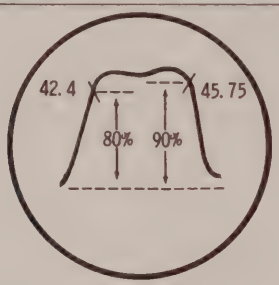


FIG. 1

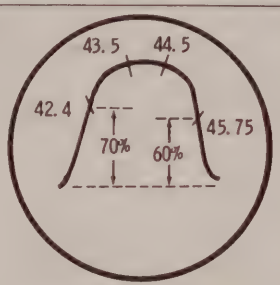


FIG. 2

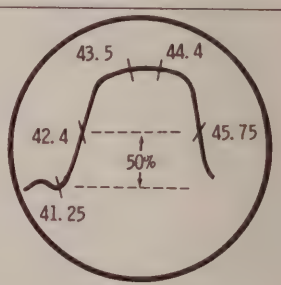


FIG. 3

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested Alignment Tools:
B1, B3.... GENERAL CEMENT #8271, 8279
WALSCO #2524, 2527
B2 ..... 1/4" Nut Driver

Turn the Horizontal Hold fully clockwise. Tune in a station and adjust the Horizontal Frequency slug (B1) until the picture is just about to tear out of sync as can be seen at the top of the picture.

Turn the Contrast fully counterclockwise and the Brightness clockwise sothat the picture appears washed out. Turn the Horizontal Drive trimmer (B2) clockwise until white vertical bars (drive lines) appear in the left center portion of the raster, then counterclockwise until the white bars just disappear.

Connect the vertical amplifier of a scope to point (C). Low side to chassis. Adjust the Horizontal Waveform slug (B3) until the round and sharp peaks of the waveform are equal in amplitude. See Fig. 4. Keep the picture in sync during this adjustment.

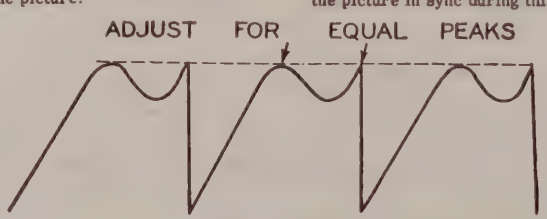
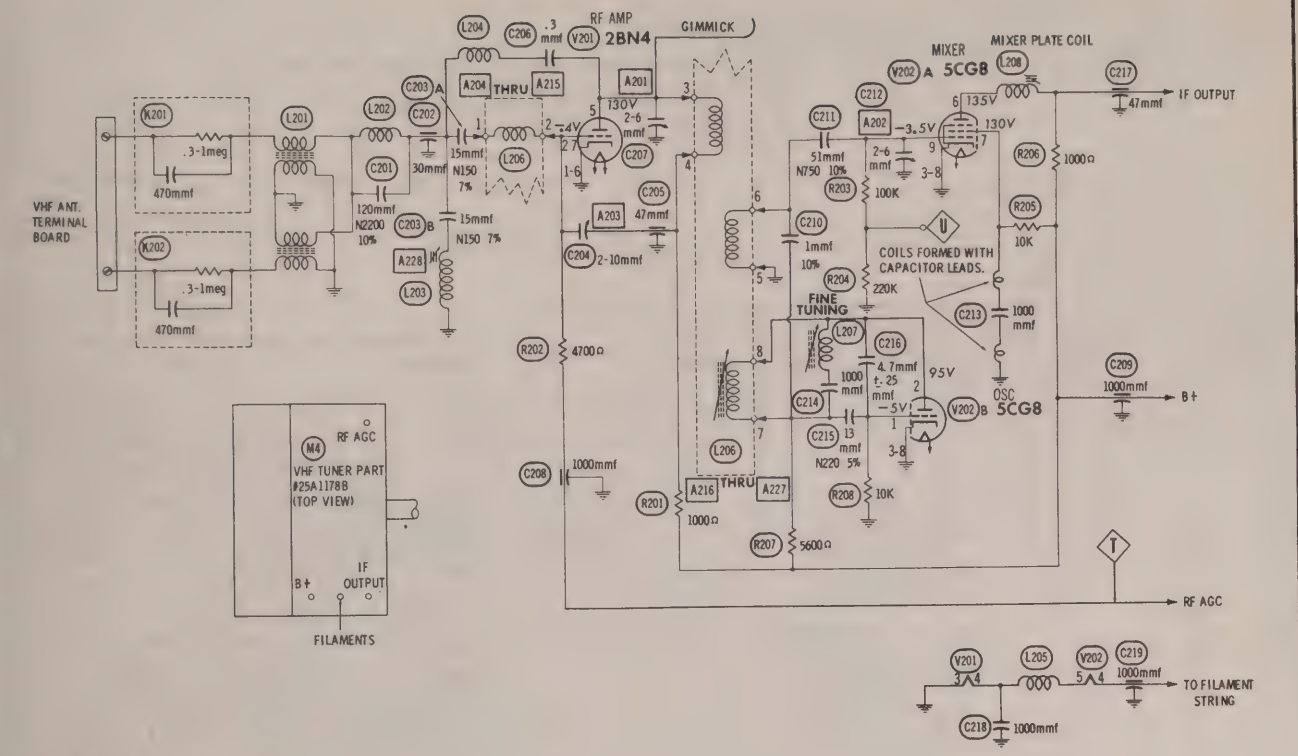


FIG. 4



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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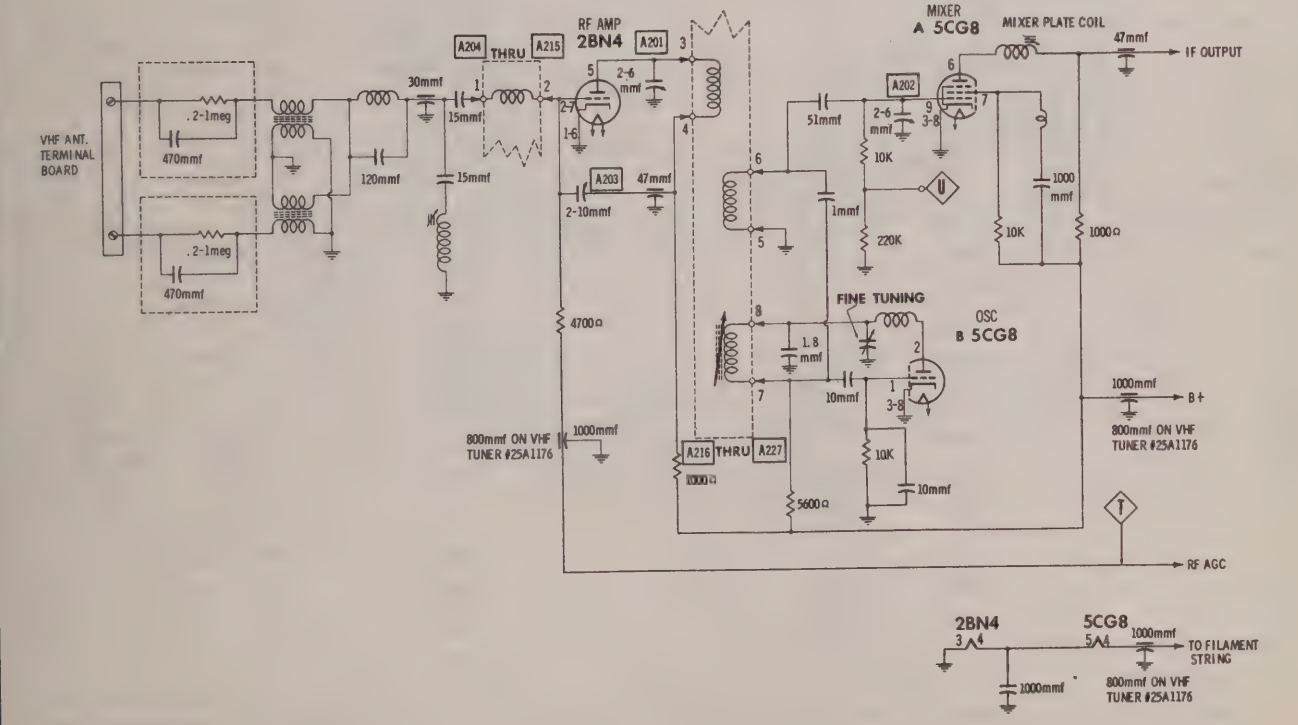
VHF TUNER 25A1178



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER 25A1175, 25A1176

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER to PROTECT the Test Equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:
A201, A202, A203 .... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A216 thru A227 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A228 ..... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Connect the negative lead of a 2.5 volt bias supply to point (T). Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (U). Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope. Recheck A201.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

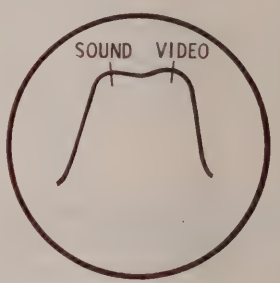


FIG.201

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect the negative lead of a 4.5 volt bias supply to point (T). Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Detector load.	A216	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

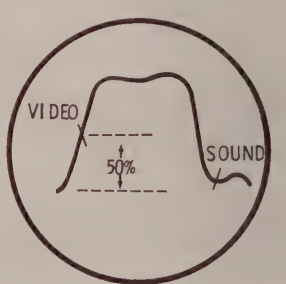


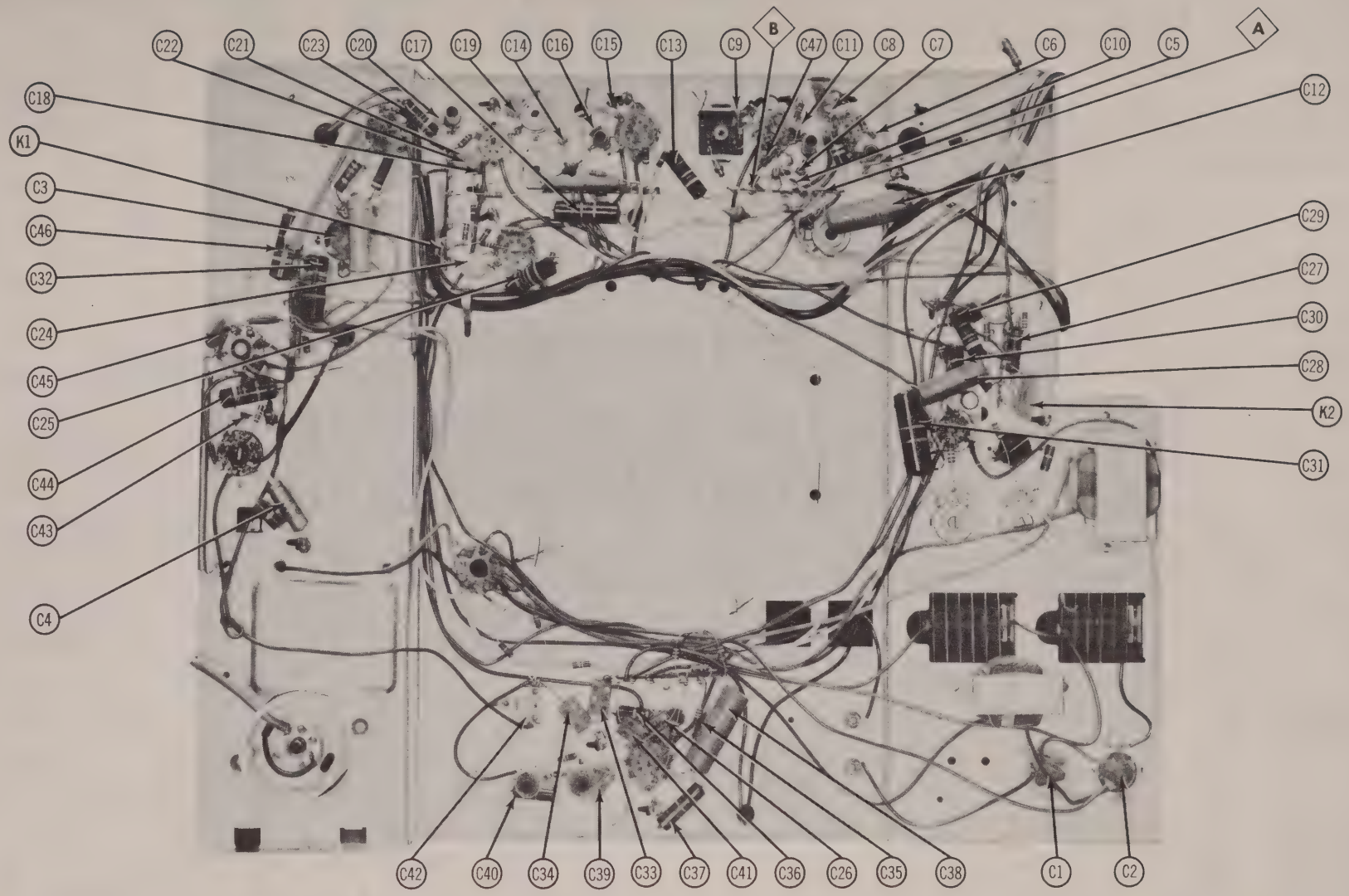
FIG.202

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

TRAP ADJUSTMENT

Some types of interference may be reduced by adjusting A228. Tune in the channel where interference occurs and adjust A228 for MINIMUM interference while observing the picture.



CHASSIS BOTTOM VIEW - CAPACITOR & ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st Video IF Amp	3DK6	3DZ6 *
V2	2nd Video IF Amp	3DK6	3CB6 *
V3	Video Output	1LB7A	
V4	Audio Det.	3BN6	
V5	Audio Output	5AQ5	
V6	Sync Sep. -Sync Amp.	6CG7	
V7	Vert. Osc. -Vert. Output	10DE7	
V8	Horiz. AFC-Horiz. Osc.	6CG7	
V9	Horiz. Output	12DQ6A	
V10	Damper	12AX4GTA	
V11	HV Rect.	1K3GT	

* Alternate

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	AMC PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V12	21CBP4A	21BTP4 ①	21CBP4-A ②	21CBP4/ ① / 21CBP4A ①	① "Aluminized" Add Ion Trap. ② "Silverama" ③ "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP.	RATING VOLT	REPLACEMENT DATA AMC PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	140	150	45X421	AFH51-23	XA0361	FP117	TMS-24	TVL-1428	
C2A	125	300	45X431	AFH402-60	XC0733.2	FP218 TC36		TVLS-3574.3*	
B	80	300							
C	20	50							
C3A	125	300	45X430	AFH3-99-82	C0733.7	FP330.27	TMT-211	TVL-3574.8	
B	160	300							
C	40	50							
C4	4	50	45X418	PRS150V4	BBR4-50	TT50X4	TD-4-50	TVA-1402	

* Not normally in distributor's stock.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING CAP.	RATING VOLT	RATING TOL.	REPLACEMENT DATA AMC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	68		NPO ±5%		NPO-DI 68	DYZ-68	C10Q68C	CNO-468	5TCC-Q68B ±5%	
C6	270		±10%		DI 270	MD-271	L10T2T		5GA-T27B ±10%	
C7	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C8	390		±5%		DI 390	MD-391	L10T39		5GA-T39B ±5%	
C9	470		±5%		DI 470	MD-471		JL-347	5GA-T47B ±5%	
C10	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C11	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C12	47	200			P3S3N-47		CUB2P47	GEM-2047	2TM-P47	
C13	.047	200			P4S3N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C14	3.3		±5%		NPO-SI 3.3	TCZ-3S3	C10V33C	CNO-533	5TCCB-V33S ±5%	
C15	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C16	30		N33 ±5%							
C17	1	400			P4S3N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C18A	1000			80X3	BPD-2X001	DD2-102	BYD6DD1	B-210	5HK-ED1	
B	1000							B-210		
C19	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C20	.15		±5%		DI 15	DD-150	L20J15	CNO-415	5TCC-Q15S ±5%	
C21	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C23	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C23	.0047	600			P4S3N-0047	DH-473	CUB4D47	GEM-4347	4TM-D47	
C24	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C25	.047	600			P4S3N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C26	18		±5%	RCM20B180K	1469-000018	TCZ-18	22R5Q18	CNO-418	MS-418	
C27	.01	600			P4S3N-01	DS-103	CUB4S1	GEM-411	4TM-S1	
C28	.047	200			P3S3N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C29	.047	200			P3S3N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C30	.01	600			P4S3N-01	DS-103	CUB4S1	GEM-411	4TM-S1	
C31	.1	600			P4S3N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C32	.047	600			P4S3N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C33	100		±5%		1469-0001	TCZ-100	22R5T1	MCB235	MS-31	
C34	82		±5%	RMC30B820K	1469-000082	TCZ-82	22R5Q82	CNO-482	MS-482	
C35	.047	200			P3S3N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C36	.047	600			P4S3N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C37	.022	200			P3S3N-022		CUB2S22	GEM-4122	2TM-S22	
C38	.47	200			P3S3N-47		CUB2P47	GEM-2047	2TM-P47	
C39	220		±5%		1469-00022	TCZ-220	22R5T22		MS-322	
C40	.01	600			P4S3N-01	DS-103	CUB4S1	GEM-411	4TM-S1	
C41	330		±5%	RCM30B331K	1464-00033		1R5T33		MS-333	
C42	370-700			17A271						
C43	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C44	.047	400			P4S3N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C45	56	5000	±5%	6TX755						
C46	.047	600			P4S3N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C47A	1000			80X3	BPD-2X001	DD2-102	BYD6DD1	B-210	5HK-ED1	
B	1000							B-210		
C48	.22	400			P4S3N-22		CUB4P22	GEM-4022	4TM-P22	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AMC PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500Ω	½	78EX30	F1-2	RTV-546			Contrast
B	1meg	½		R2-51	Not Req.	† QJ-1074	†† UX378S8	Volume
C	Switch			KR-1	Not Req.			Power Off-On
R2A	500K	½	40X423	B-59	A47-500K-S	QU-133	TA55L	Brightness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	50K	½	40X424	B-31	A47-50K-Z	QU-123	TA54L	Horiz. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	1meg	½	40X425	B-69	A47-1meg-S	QU-137	TA16L	Vert. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	1500Ω	½	40X399	AB-6	A47-1500-S	QU-109	PTA152L	Vert. Lin.
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R6A	2.5meg	½	40X398	EK-83	A47-2.5meg-S	QU-239	PTA26L	Height
B	Shaft			Not Req.	RN-3	TQ	Not Req.	
R7	7meg	½	40X455					Range (AGC)
R8	500Ω	2(WW)	40X397		39-500		FL-500	Buzz

† "Concentrikit" Equivalent: K-3 Kit with Base Elements & Shafts: BH-105, P6-102 (Panel), BH-137, RH-126(Rear), 78-1 (Switch)
†† "STA-LOC" Equivalent: FA75LL, OF125A, HU16L, BH87S, US-4L

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	AMC PART No.	NOTES
R9	2.2meg		B84225	Note 1
R10	10K ±%			
R11	10K	2W		Note 2
R12	56Ω ±%			Note 3
R13	22K			
R14	470Ω			
R15	150Ω			Note 4
R16	1meg			
R17	5600Ω			
R18	1meg			
R19	47Ω			
R20	3600Ω	4W	43X331	
R21	180K			
R22	100K			
R23	680Ω			
R24	4700Ω			
R25	330K			
R26	330Ω	1W		
R27	470Ω	1W		
R28	33K			
R29	2.2meg			
R30	1.5meg			
R31	680K			
R32	47K			
R33	6800Ω			
R34	4700Ω			
R35	470K			
R36	390K			
R37	22K			

ITEM No.	RATING OHMS	RATING WATT	AMC PART No.	NOTES
R38	4700Ω			
R39	15K			
R40	1000Ω	1W		
R41	2.2meg			
R42	100Ω			
R43	10meg			
R44	560Ω			
R45	560Ω			
R46	220K			
R47	820K			
R48	330K			
R49	120K			
R50	82K			
R51	330K			
R52	3900Ω			
R53	82K			
R54	22K			
R55	1meg			
R56	56K			
R57	470K			
R58	68Ω			
R59	10K	2W		
R60	100Ω	2W		
R61	5600Ω			
R62	1550Ω	10W	43X307	
R63	52Ω	20W	43X302	Note 5
R64	7.5Ω		43X280	
R65	10K			

Note 1. Not used in some versions.
Note 2. Some versions may use 470Ω in this application.
Note 3. Some versions may use 47Ω ±% in this application.
Note 4. Some versions may use 180Ω in this application.
Note 5. Some versions may use 57Ω 10W in this application.

COILS (RF-IF)

ITEM No	USE	REPLACEMENT DATA AMC PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1A	1st Video IF	9A2435			6221 *		
B	41.25MC Trap						
L2	2nd Video IF	9A2444					
L3	3rd Video IF	9A2435					Includes 30 microhenries Resonant choke
L4	Resonant Choke	9A2375					30 Microhenries
L5	Shunt Peaking Coil	36A22	19-3300 ▲	TV-199 ▲	6155 ▲		290 Microhenries, wound on 22K resistor
L6	4.5MC Trap	9A2366	20-1004	TV-151	1469 ●	SF-3	
L7	Series Peaking Coil	36A28	19-4400 ▲	TV-190 ▲	6132 ▲	VP-7 ●	350 Microhenries, wound on 6800Ω resistor
L8	Shunt Peaking Coil		19-3300 ■	TV-199 ■	6155 ■		290 Microhenries, wound on 470Ω resistor
	Shunt Peaking Coil	36A38	19-4201 ■	TV-197 ■	6154 ■		220 Microhenries, wound on 470Ω resistor ①
L9	Sound IF	9A2434	17-1036				
L10	Quadrature Coil	9A2367	20-1005	TV-121	1460		
L11	RF Choke	9A2111	19-1001	RC-582	4004		1.5 Microhenries

① Alternate part used in some versions.
* Disregard secondary winding.
▲ Parallel with 22K resistor.
▲ Parallel with 6800Ω resistor.
● Disregard tap.
■ Parallel with 470Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA AMC PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L12	72Ω		9A237I		TV-186	6211 *		RS-7	Horiz. Freq. tapped @ 80Ω
L13	48Ω		9A237Z			6315		RS-5 *	Horiz. Waveform
									* Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE @ CURRENT 1000 (~)	REPLACEMENT DATA AMC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L14	.260A	40Ω	1 Hy.	52X96-9	26C43 ①	C-2991 ①		C-2326 ①	26C43 ①	C-27X

① Drill new mounting hole.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA AMC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Vert. Osc.	54X19	26A03	A-3003	V405	VBO19	A-8125	26A03	A-97X
T2	Vert. Output	51X186-2	26S73 ③	A-2855	V307①②	VO26 ①	VO-105	26S73 ③	A-118X②③
T3	Yoke-Horiz. (24MH)	9A2403 ④	Y-18	MDF-52	Y90P19/43		DY-16A	Y-18	Y-45 &
	(90°)-Vert. (39MH)		⑤ ⑥	⑤⑥①	⑤ ⑥		⑤⑥①	⑤ ⑥	NW2L ⑥
	Rear Cover & Centering Device	2A435							YC-1
	Yoke Retainer	8X247							CL-1
	Yoke Clamp	30X61J							
T4	Horiz. Output	53X362G	FLY-143	HVO-157	X174	EFR188	HO-263 *	FLY-143	D-121 *
	Alt. Horiz. Output	53X362	⑤ * ⑦	③ * ⑦		③ ⑤ * ⑦		③ * ⑦	

① Connect as autoformer.
② Use 8 : 1 turns ratio.
③ Drill new mounting hole(s).
④ Includes resistors (R44, R45).
⑤ Use original rear cover and centering device.
⑥ Connect same as original.
⑦ Remove Horizontal Damping Network from yoke.
⑧ Trim 1½" from top of terminal board.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	4	5	5		5	8	4	4
	7	2	2		2	3	8 & 7	3
	6	6	6		6	2	2	2
	5	1	1		1	1	5	1
Special Notes →		⑨	⑨		⑨			⑨

⑨ Remove one turn from filament winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA AMC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	6100Ω	3-4Ω	51X185	24S51 ①	A-3026	AU-602 ①	A-3877 ①	24S51 ①	S-6X	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA AMC PART No.	QUAM PART No.	NOTES
SP1	5"	PM	8-8Ω	12A550 ①	5A15Z6.6 ①	① Connect in parallel and phase.
SP2	5"	PM	8-8Ω	12A550 ①	5A15Z6.6 ①	② Alternate.
	5"	PM		12A527 ②		

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AMC PART No.	REPLACEMENT DATA	
K1	Sync Coupling	150mmf, 270K	78X16		
K2	Vert. Integrator	2000mmf, 5000mmf, 5000mmf, 22K, 6200Ω, 6200Ω	78X7	Aerovox Centralab Cornell-Dubilier Sprague	PA-110 PC-100 U5TMI V-1/V-3
K3	Chassis Isolation	470mmf ⑧ 1500V, .3-1meg	78X11	Centralab Sprague	RC-471 ACI-1

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA AMC PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.240A	66X14 ①	1236AH ①	T300 ①	300 ①	① Selenium Type.
			2A504 ②	TV500 ②	40K ②	② Silicon Type.
M2	.240A	66X14 ①	1236AH ①	T300 ①	300 ①	
			HA504 ②	TV500 ②	40K ②	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA AMC PART No.	CRS PART No.	SYLVANIA PART No.	NOTES
M3	1N60 *		1N60	1N60	Video Detector (Pigtail) * Some versions may use CK706 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	AMC PART No.	NOTES
M4	Tuner	25A-117BB	VHF
	Tuner	25A-117S	VHF
	Tuner	25A-117S	VHF
	Tuner	25A-115B	UHF
	Thermal Switch	2A494-B	
	Magnet	2A476	Beam Alignment, may be used to improve focus

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

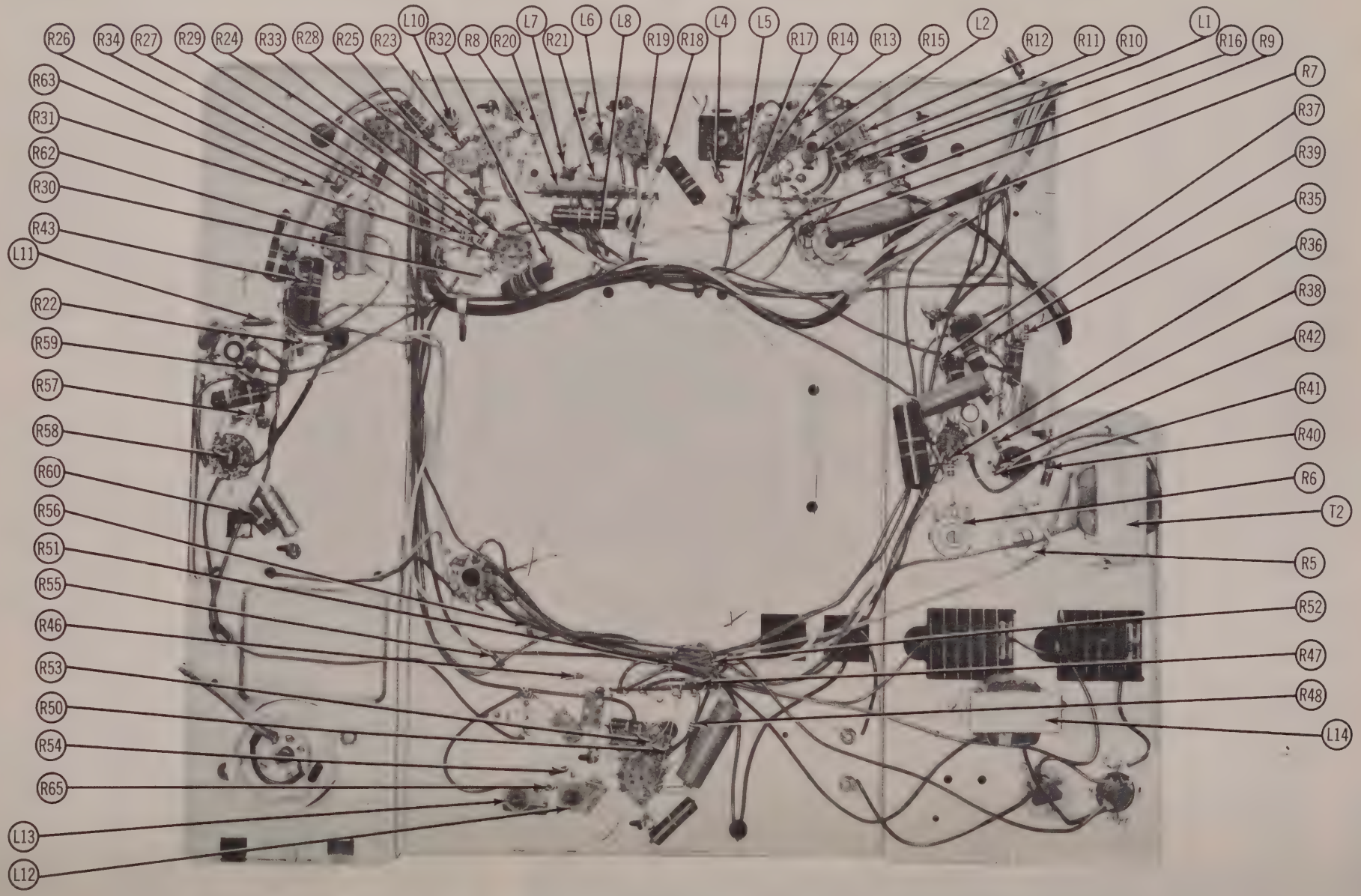
NAME	PART NO.	DESCRIPTION
Safety Glass	17X199-1	
Mask	4X1407-4	Gold
Mask	4X1407-5	Silver
Knob	10A895-2	Channel Selector
Knob	10A895-2	Fine Tuning
Knob	10A893-2	UHF Tuning
Knob	10A894-2	UHF Indicator
Knob	10A833-3	Contrast
Knob	10A832-1	Volume
Knob	10A834-1	Secondary Controls, Gold
Knob	10A834-2	Secondary Controls, Silver

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8865 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8468 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

AMC MODELS 3868-1, -UHF, 3870-1, -UHF, 3898-1, -UHF

FOLDER 1



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUNER PARTS LIST AND DESCRIPTIONS

25A1178

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	2BN4	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	120		N2200 10%	13L-031						
C202	30			13M420U300J-01						
C203A	15		N150 7%	13L8PG150N2						
B	15									
C204	2-10			31B-206-08		829-10				
C205	47			13M130U470J-01						
C206	.3			13D-111-42						
C207	2-6			31B-206-01		829-6				
C208	1000			13M420EA102Z-01	EF-1000	MFT-1000				
C209	1000			13M420EA102Z-01	EF-1000	MFT-1000				
C210	1.0		10%	13D-111-35	NPO-SI 1.0	TCZ-1.0		CNO-510	5TCCB-V1S 10% *	
C211	51		N750 10%		N750-DI 51	TCZ-51	C10Q51U		5TCU-Q51S 10% *	
C212	2-6			31B-206-01		829-6				
C213	1000			31J-024	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C214	1000			13L6X102Z	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C215	13		N220 5%	13L8R130J						
C216	4.7		±.25mmf	13L8R4R7C				CNO-547	5TCCB-V47S ±.25mmf*	
C217	47			13M420Q470J-01						
C218	1000			13L6X102Z	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C219	1000			13M420EA102Z-01	EF-1000	MFT-1000				

* Not normally in distributors stock. Available thru distributor on order to manufacturer.
NOTE: Part numbers listed above are "Standard Coil" Part Numbers.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PART No.	NOTES
	OHMS	WATT		
R201	1000Ω			
R202	4700Ω			
R203	100K			
R204	220K			

ITEM No.	RATING		PART No.	NOTES
	OHMS	WATT		
R205	10K			
R206	1000Ω			
R207	5600Ω			
R208	10K			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA	
K201	Antenna Isolation	470mmf, .3-1meg	13P-198-02	Centralab Sprague	RC-471 AC1-1
K202	Antenna Isolation	470mmf, .3-1meg	13P-198-02	Centralab Sprague	RC-471 AC1-1

NOTE: Part numbers listed above are "Standard Coil" Part Numbers.

COILS (RF-IF)

ITEM No.	USE	PART No.	NOTES
L201	Ant. Trans.	31T-3397	†
L202	IF Trap Coil	34A-748	†
L203	IF Trap Coil	34A-762	
L204	RF Choke	34A-1005	
L205	Fil. Choke	31K-137-027	

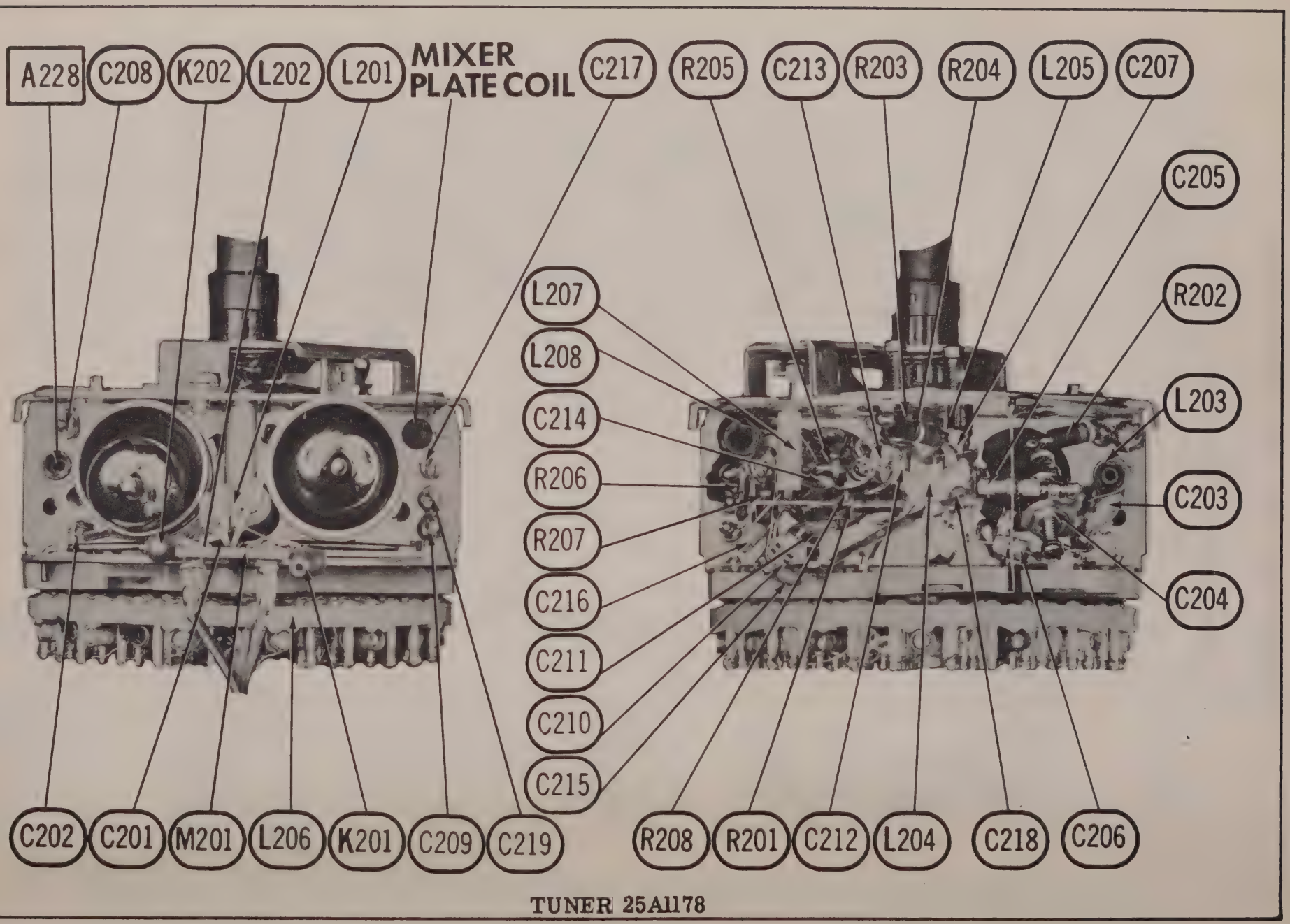
ITEM No.	USE	PART No.	NOTES
L206	Ant, RF, Mixer Grid & Osc. Coils	31T-3361-07	Includes Rotor Disc Assy.
L207	Fine Tuning Coil	34A-787-03	
L208	Mixer Plate Coil	31UA-580-017	

† Part of M201. NOTE: Part numbers listed above are "Standard Coil" Part Numbers.

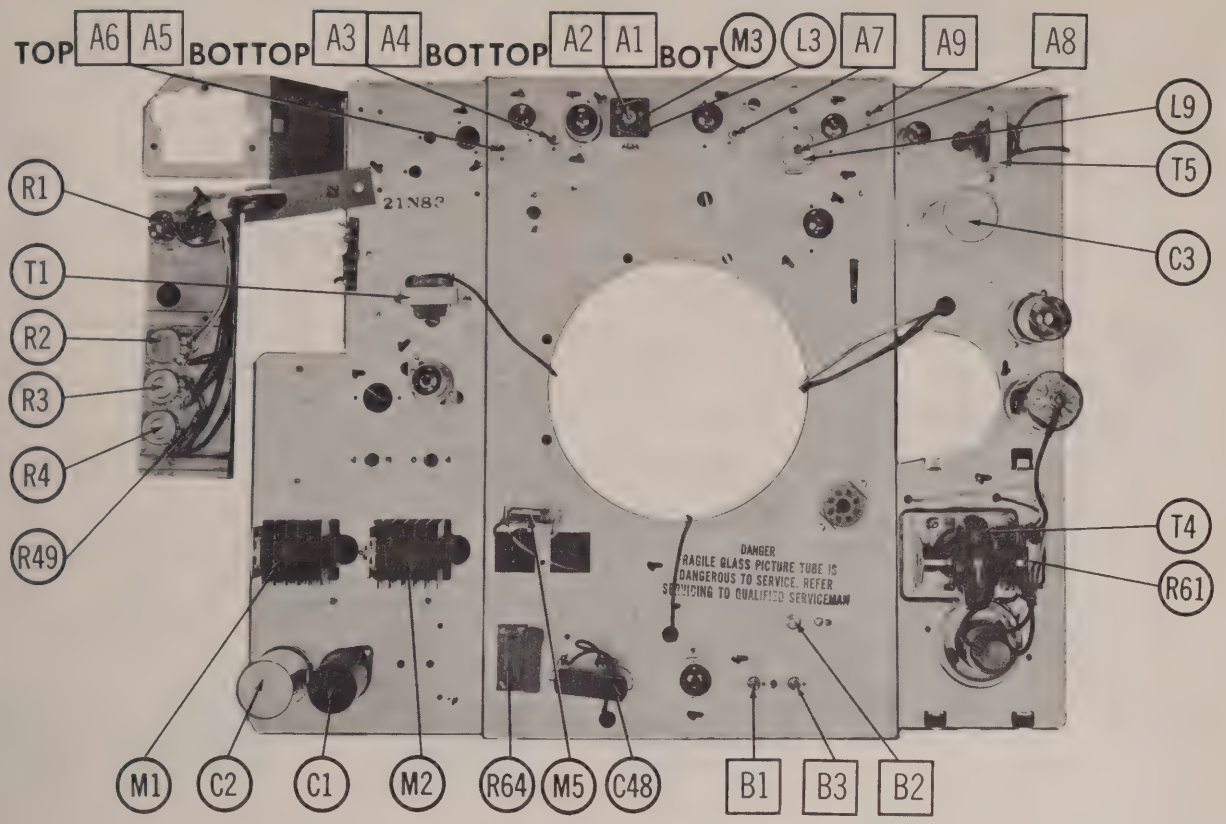
MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M201	Antenna Input Assy	31T-3398-02	Includes C201, L201, L202, K201 and K202
	Retaining Spring	23A-172	
	Locking Spring	23A-131	
	Contact Spring	23A-132-02	
	Detent Spring	23A-145	
	Oscillator Slug	9E-501-01	

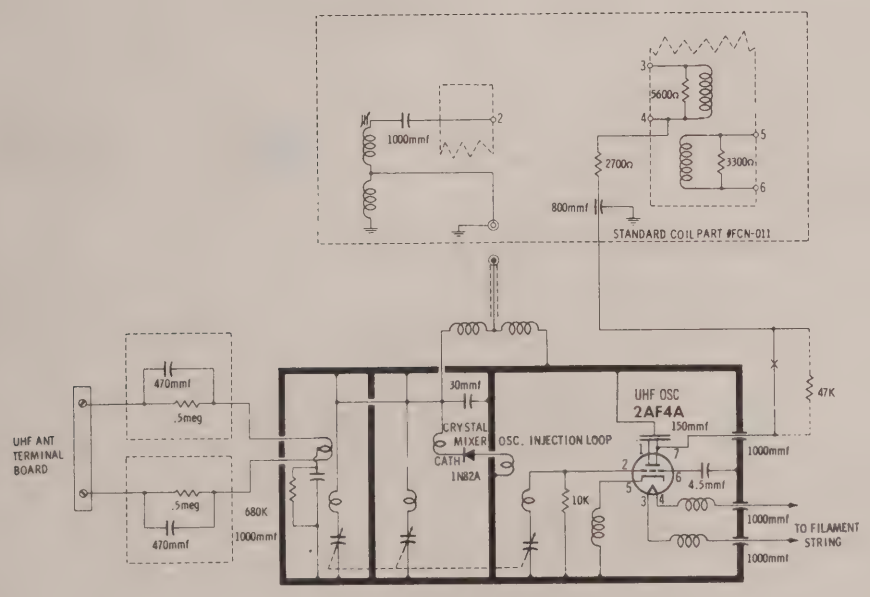
NOTE: Part numbers listed above are "Standard Coil" Part Numbers.



TUNER 25A1178



CHASSIS - TOP VIEW



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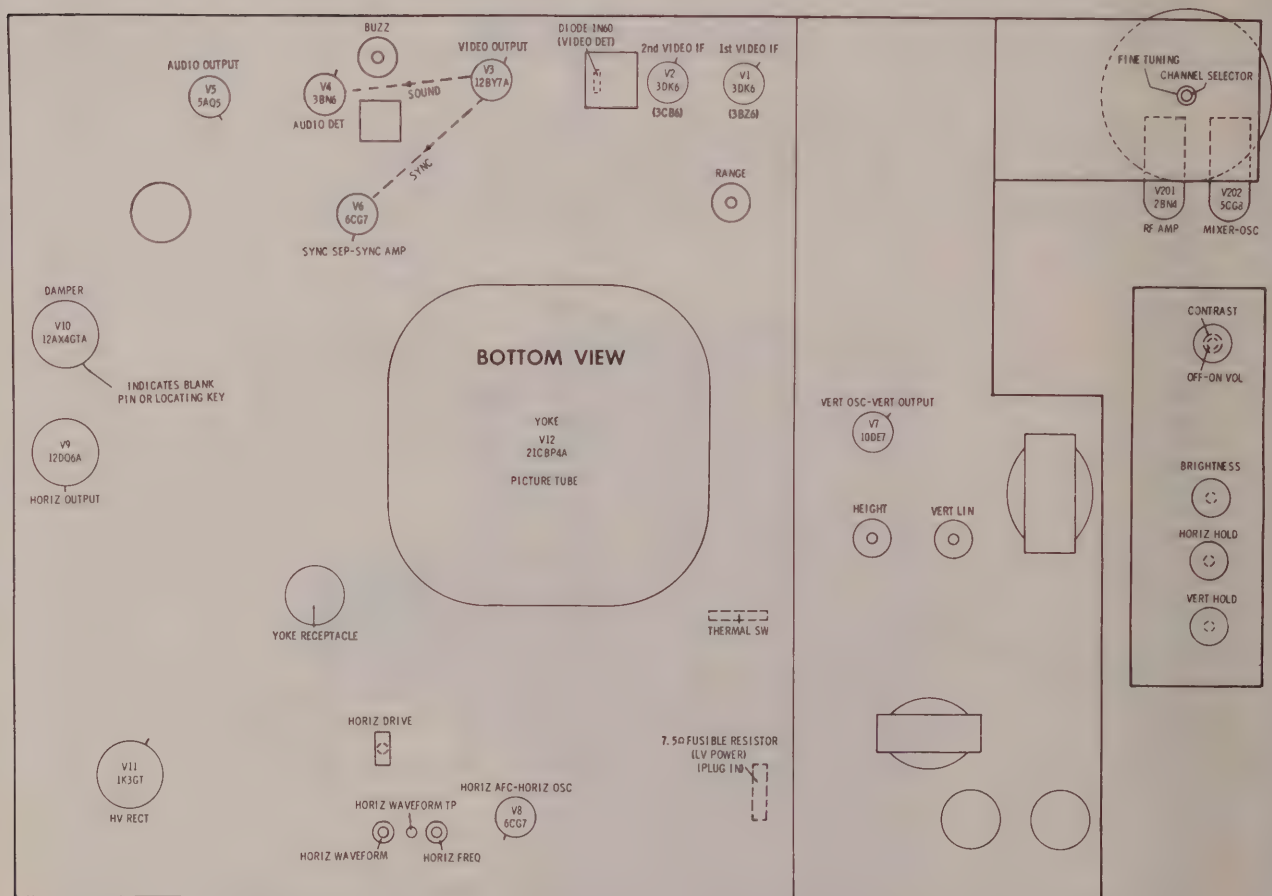
UHF TUNER 25A1159

RESISTANCE MEASUREMENTS

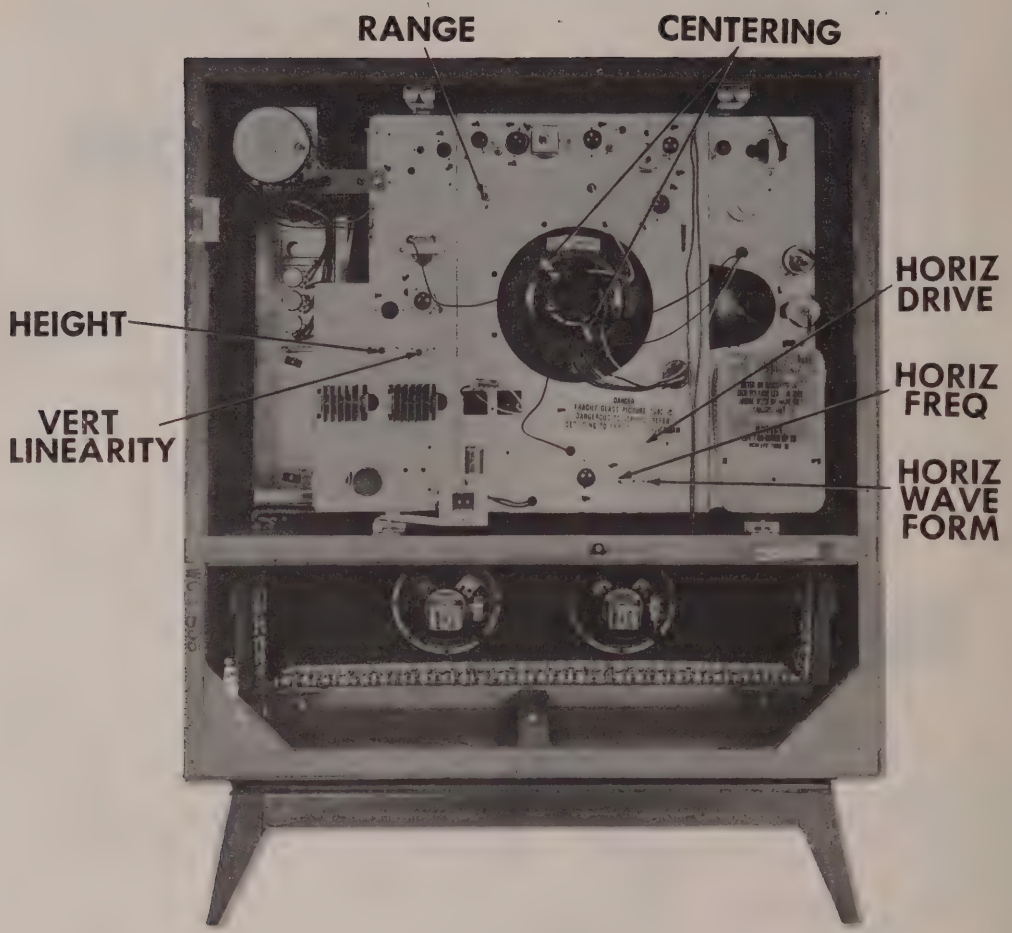
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3DK6	750K	56Ω	9Ω	10Ω	†10K	†10K	0Ω		
V2	3DK6	.1Ω	150Ω	10Ω	11Ω	†2000Ω	†2000Ω	0Ω		
V3	12BY7A	•300Ω	1meg	0Ω	13Ω	13Ω	12Ω	†3600Ω	†1550Ω	0Ω
V4	3BN6	•320Ω	6Ω	9Ω	8.5Ω	†6200Ω	4.8Ω	†330K		
V5	5AQ5	0Ω	330Ω	16Ω	15Ω	†900Ω	†470Ω	0Ω		
V6	6CG7	†1.5meg	2.2meg	0Ω	12Ω	11Ω	†13K	47K	0Ω	0Ω
V7	10DE7	†400Ω	2.2meg	2.2meg	15Ω	13Ω	• †1.6meg	• 900K	200Ω	• 1800Ω
V8	6CG7	†56K	410K	0Ω	8.5Ω	7.5Ω	•†38K	1.5meg	410K	0Ω
V9	12DQ6A	TP	4Ω	NC	†10K	470K	NC	6Ω	100Ω	TOP CAP †10Ω
V10	12AX4GTA	NC	NC	¶1.2meg	NC	†.1Ω	NC	4Ω	2Ω	
V11	1K3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP †310Ω
V12	21CBP4A	6Ω	• 20K	Pin 6 †100K	Pin 10 †10meg	Pin 11 • 250K	Pin 12 7.5Ω			
V201	2BN4	0Ω	5000Ω	0Ω	.5Ω	†2500Ω	0Ω	5000Ω		
V202	5CG8	10K	†7100Ω	0Ω	2Ω	.5Ω	†2500Ω	†11K	0Ω	320K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 255V SOURCE.
† MEASURED FROM PIN 3 OF V10.

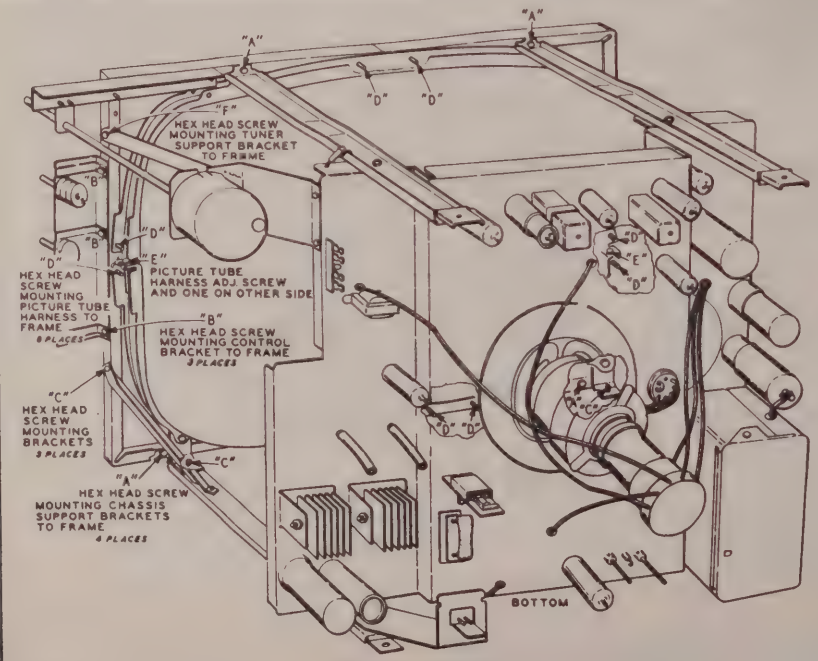
NC NO CONNECTION.
TP TIE POINT



TUBE PLACEMENT CHART



DISASSEMBLY INSTRUCTIONS



PICTURE TUBE REMOVAL

1. Remove 4 screws marked "A".
2. Remove 3 screws marked "B" and 1 screw marked "F".
3. Remove 3 screws marked "C" and lift chassis from picture tube frame assembly.
4. Loosen 8 screws marked "D" and 2 screws marked "E".
5. Remove old picture tube and install new tube reversing the steps outlined, keeping the following in mind:

   a. There is a mold match line on the picture tube. Assemble the harness to the picture tube, centering the harness over the mold match line on picture tube. Holes are provided in harness to check the centering. Then tighten the screws marked "E" until the picture tube is firmly in place on harness.
   NOTE: If the above is not observed, difficulty may be encountered in replacing the entire assembly in the cabinet.

PHOTOFACT* Folder

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

ZENITH CHASSIS 18C20,
Q, U, 18C24Q

MODEL C3014R (Ch. 18C20Q)

ZENITH CHASSIS 18C20,
Q, U, 18C24Q

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SET 452 FOLDER 2

PHOTOFACT* Folder

DISASSEMBLY INSTRUCTIONS

DISASSEMBLY INSTRUCTIONS MODEL C3014R

1. Remove 5 push-on type knobs from front and one push-on type knob from the rear.
2. Remove 7 wood screws holding rear cover. Remove rear cover.
3. Remove Remote Control plug, Tone control plug, speaker leads and tuner leads.
4. Remove 2 screws holding On-Off Volume control.
5. Remove 2 screws at top left rear of cabinet holding tuner.
6. Remove tuner.
7. Remove 4 chassis.
8. Remove chassis.
9. Remove 3 chassis bolts holding remote control chassis. Remove chassis.

MODEL C3014R (Ch. 18C20Q)

TRADE NAME	Zenith	MODELS	CHASSIS
		C2330E, R, C2358E, R, W, C2359E, W, C2360M, R	18C20
		C2330EU, RU, C2358EU, RU, WU, C2359EU, WU, C2360MU, RU	18C20U
		C3010E, H, R, C3011E, W, Y, C3012H, R, C3013H, C3014H, R	18C20Q
		C4007E, R, C4012H, R	18C24Q
		Remote Control	S-45834
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Avenue, Chicago 39, Illinois		
TYPE SET	Television Receiver with Remove Control		
TUBES	TV: VHF-Eighteen, UHF-Nineteen, Remote Control-Eight		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 210 Watts, 1.9 Amp. @ 117 Volts AC (While Tuning) 240 Watts, 2.2 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 2 screws holding the trim strip at the bottom edge of the safety glass.
Remove "Space Command" control box bracket by pulling straight out.
Tilt glass out and remove.

FUSE

One fuse is used for low voltage power supply protection. (For location, see "Tube Placement Chart".) The Remote Control low voltage power supply also protected by a fuse.

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, it is necessary to remove the rear cover. The adjustments are accessible thru a hole in the rear of the tuner.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus control. (For location, see "Tube Placement Chart".)

SYNC STABILITY

Sync stability may be varied by means of a Fringe Lock control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by adjusting a metallic sleeve, located between the yoke and the picture tube neck, in or out of the yoke.

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

PINCUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible. Position the 2 magnets so that all sides are straight.

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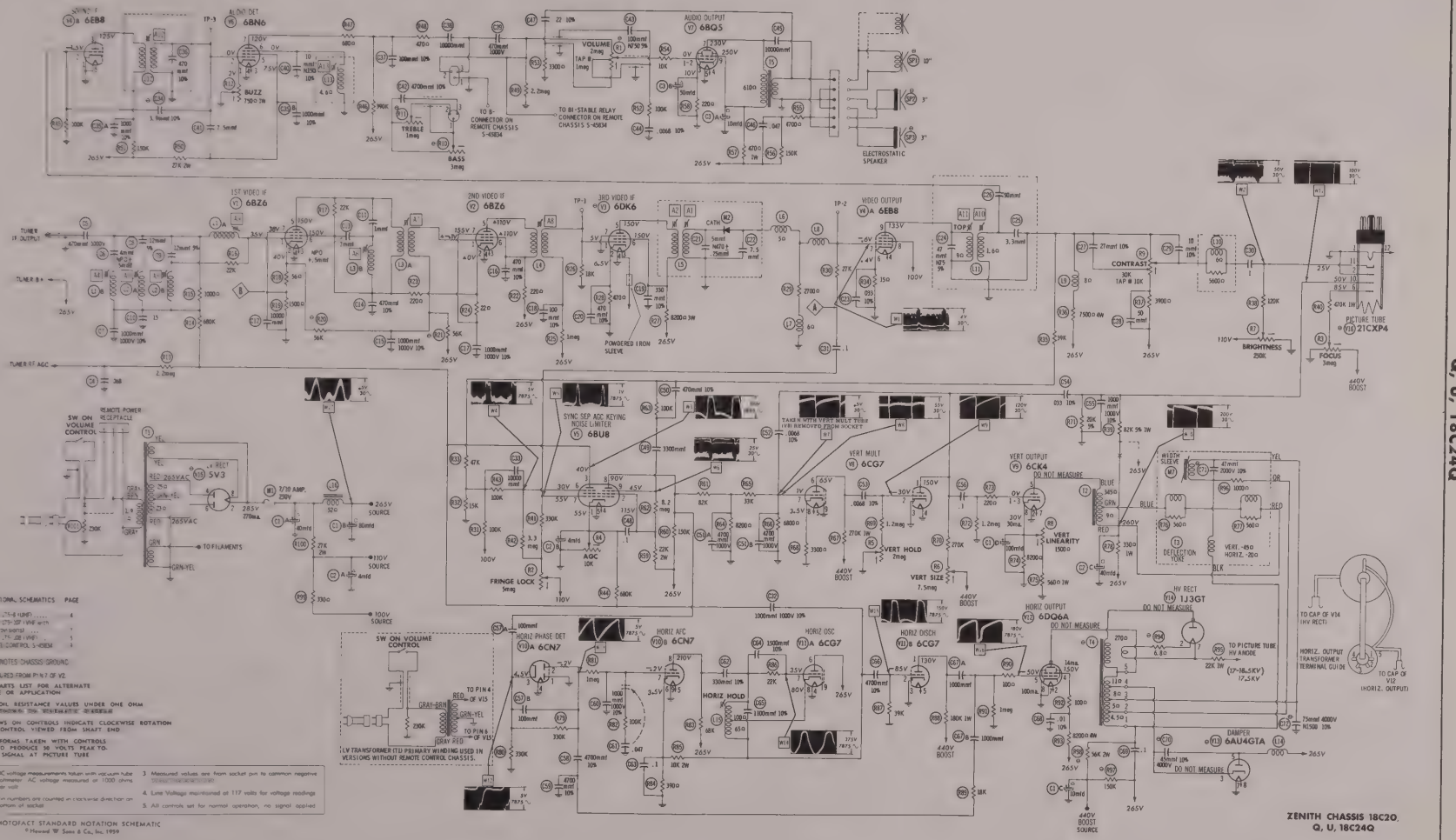
J380

ZENITH CHASSIS 18C20, Q, U, 18C24Q

SET 452 FOLDER 2


ZENITH CHASSIS 18C20,
Q, U, 18C24Q
ADDITIONAL SCHEMATICS PAGE
DENOTES CHASSIS GROUND
MEASURED FROM PIN 7 OF V2.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1 DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in a clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
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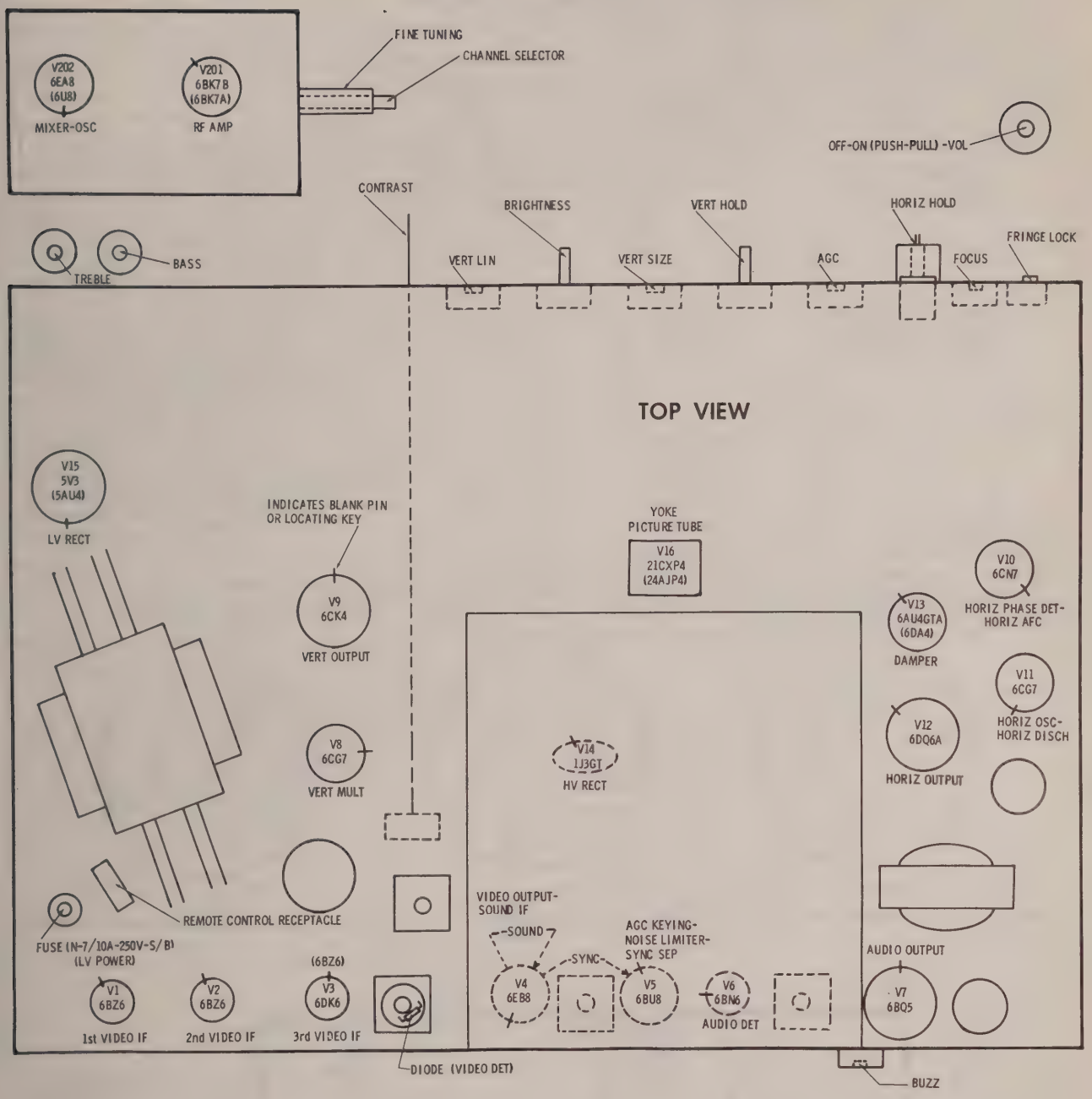
ZENITH CHASSIS 18C20,
Q, U, 18C24Q

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (B+), V15

SWEEP FAILURE
No raster, has sound V10, V11, V12, V13, V14, V16
No vertical deflection V8, V9
Poor vert. linearity or foldover V8, V9
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, V15
Vert. off freq. V8
Horiz. off freq. V10, V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det), V4
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V4, V16
Has pic, no sound V4, V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V5
No horiz. sync V5, V10
No vert. or horiz. sync V5

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: A1 thru A13.... General Cement #8606, 8606L, 8682, 9295
Walsco #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470mmf	High side to TP1. Low side to chassis. Connect a 56Ω carbon resistor across sweep output.	44MC (10MC Swp)	39.75MC 41.25MC 45.75MC	Between any two channels	Vert. Amp. thru 10K to TP2. Low side to chassis. (Across Video Det. load)	A1, A2	Set sweep generator output to produce 3 volts peak to peak on scope. Adjust A1 and A2 alternately for maximum gain and symmetry with the 45.75MC marker positioned as shown in Fig. 1. The 39.75MC marker can fall within ±.5MC of the specified frequency. If the desired response cannot be obtained, check to see that the cores are entering their respective windings from opposite ends of the coils.
2.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A3, A4, A5, A6	Connect a clip lead from point Ⓐ to chassis. Connect a clip lead from TP3 to point Ⓑ. Use high scope again and adjust A3 thru A6 for MINIMUM marker amplitudes as in Fig. 2. A3 controls the 39.75MC marker, A4 controls the 41.25MC marker and A5 and A6 control the 47.25MC marker.
3.	"	"	"	41.25MC 42.75MC 45.0MC 45.75MC	"	"	A7, A8, A9, & Mixer Plate Coil	Remove clip lead from point Ⓑ and connect to chassis. Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. A7 affects low side of curve and A8 affects the high side. Remove clip leads.

SOUND IF ALIGNMENT

Connect an adjustable attenuator between the antenna and the receiver antenna terminals. Tune in a TV station and adjust the attenuator until the signal is below the limiting level of the 6BN6 as evidenced by a hiss similar to super-regeneration in the sound. Adjust A10, A11, A12 and A13 for maximum sound and best quality. Adjust the Buzz control for MINIMUM buzz. If the hiss disappears during alignment, further reduce the signal until the hiss returns.

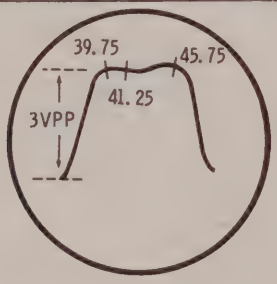


FIG. 1

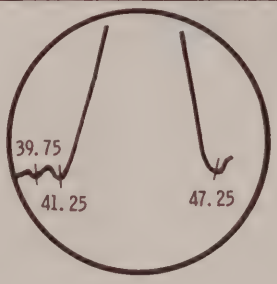


FIG. 2

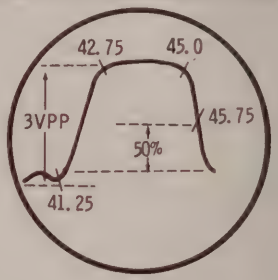
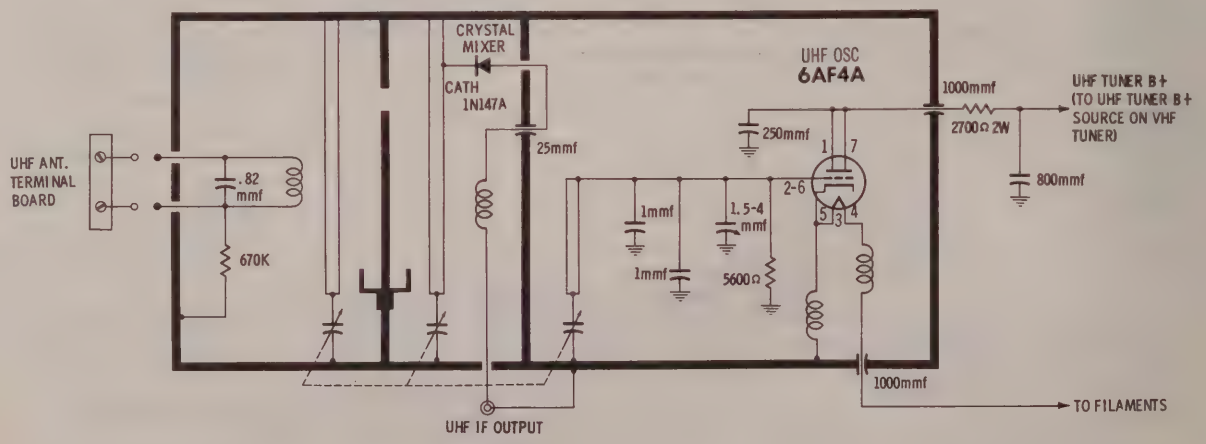


FIG. 3



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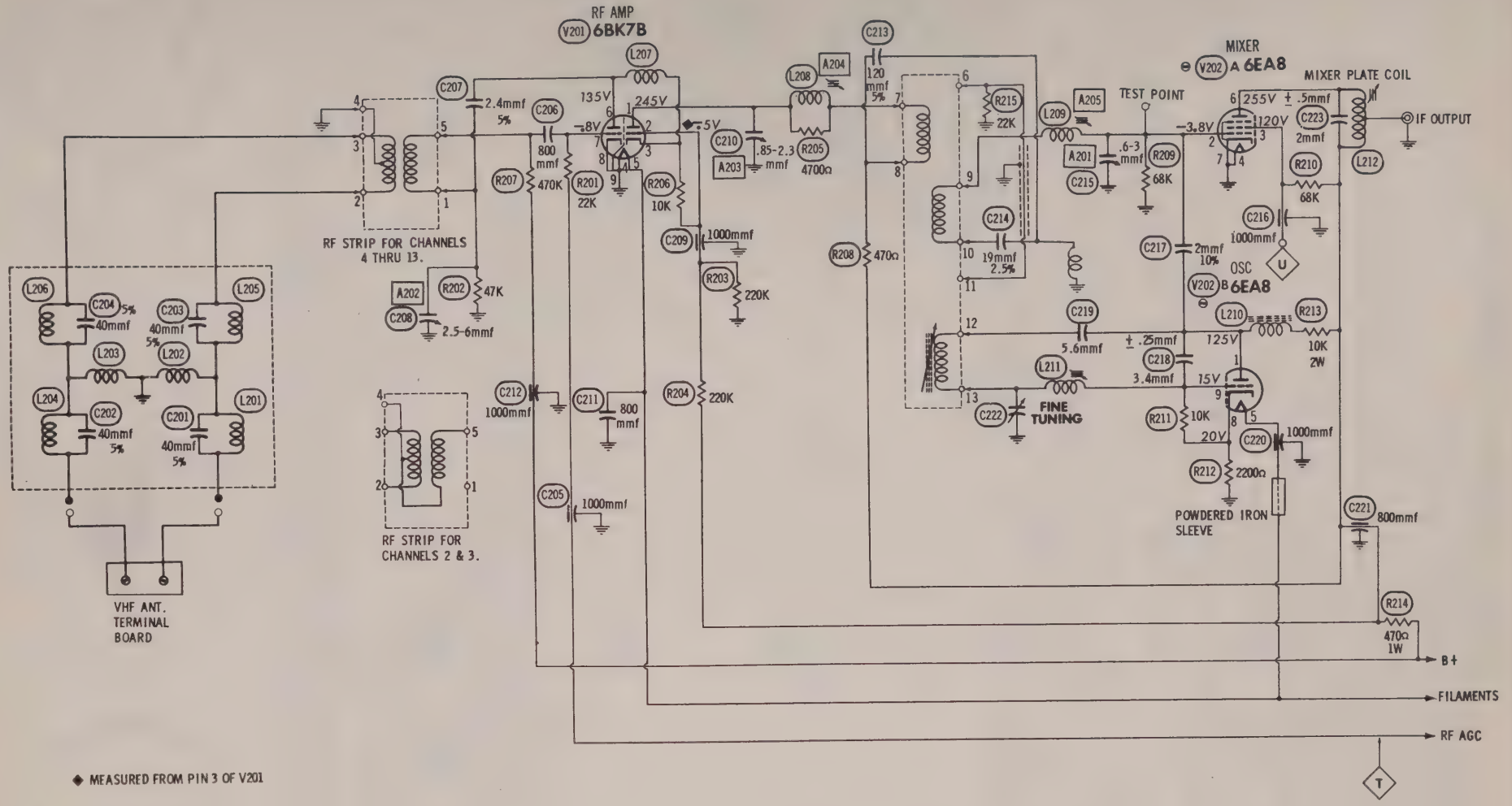
UHF TUNER 175-8



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VHF TUNER 175-108

ZENITH CHASSIS 18C20, Q, U, 18C24Q

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS FOR TUNERS #175-107, #175-108

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF OSCILLATOR ALIGNMENT

Individual channel adjustment screws are accessible one at a time, thru a hole in the back of the tuner, as the channel selector is rotated. Set the Fine Tuning to the center of its range and switch to channel to be adjusted. Adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point (T). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	50-300Ω Matching Trans.	Across VHF antenna terminals thru matching transformer.	69MC (10MC Swp)	67.25MC 71.75MC	4	Vert. Amp. thru 10K to point (U). Low side to chassis.	A201, A202, A203	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
2.	"	"	201MC (10MC Swp)	199.25MC 203.75MC	"	"	A204, A205	Adjust for maximum gain and symmetry of response similar to Fig. 201. with markers as shown. Repeat steps 1 and 2 until best overall symmetry is obtained.

UHF ALIGNMENT FOR TUNER #175-4

Alignment of the UHF tuner should not be attempted without the proper test equipment.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Fig. 202	Across UHF antenna terminals thru matching network (Fig. 202).	713MC (10MC Swp)	711.25MC	53	Vert. Amp. thru 10K across video detector load.	A206, A207, A208	With the UHF tuning knob set to channel 54, the rocker arm on the tuner should be in the horizontal position. If necessary, loosen set screw and turn the shaft independently of the pulley until the arm is in the horizontal position with the channel indicator on channel 54. Tighten the set screw. If the calibration is off more than 3 channels, adjust A206 to place video marker at 50% on curve as in Fig. 203. The image (weaker response) will appear also. The response toward counterclockwise position of A206 is the proper response. Adjust A207 and A208 for maximum amplitude of response similar to Fig. 203.
4.	"	"	473MC (10MC Swp)	471.25MC	14	"		Check for response similar to Fig. 203. If the oscillator is off more than 3 channels, adjust oscillator travel adjustment (osc., mixer and antenna travel adjustments are the three hex nuts on top of the UHF tuner next to the tuner chassis) to scale. Care must be used when making the adjustment so as not to move the rocker arm out of its bearing. Set the mixer and antenna travel adjustments for maximum response on scope.
5.	"	"	887MC (10MC Swp)	885.25MC	83	"	A209, A210, A211	Adjust A209 to place marker at 50% on curve similar to Fig. 203. Adjust A210 and A211 for maximum amplitude and symmetry.

UHF ALIGNMENT FOR TUNER 175-2

Alignment of the UHF tuner should not be attempted without the proper test equipment.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough generator output to provide a usable indication on VTVM.
Adjust A222 for the most satisfactory picture with MINIMUM noise on any UHF station.
Remove the AGC cable between the tuners at the UHF tuner socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead.	473.5MC (Unmod)	14	DC probe to point (V). Common to chassis.	A223	Adjust for maximum deflection.
4.	"	"	887.5MC	83	"	A224	"

5. The Oscillator pickup coil (A225) is the short wire connected to the crystal inside the oscillator tuning gang section. Oscillator injection is changed by moving the wire in or out of the oscillator section of the tuning gang. Set tuning gang at mid range. Connect the negative lead of a 0-50 microammeter thru 5600Ω to point (V). Positive to chassis. Remove B+ at point (W) and note reading. Apply B+ and note reading. The difference between the readings should be between 10 and 40 microamps for proper injection.

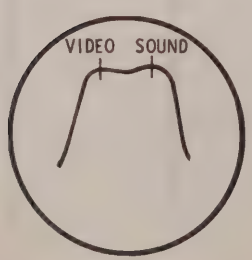


FIG.201

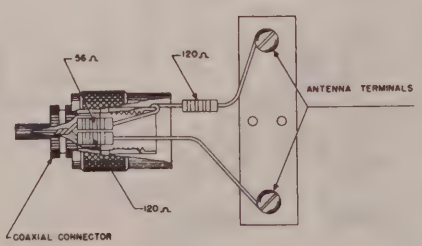


FIG.202

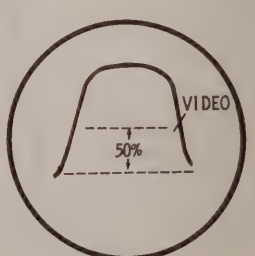
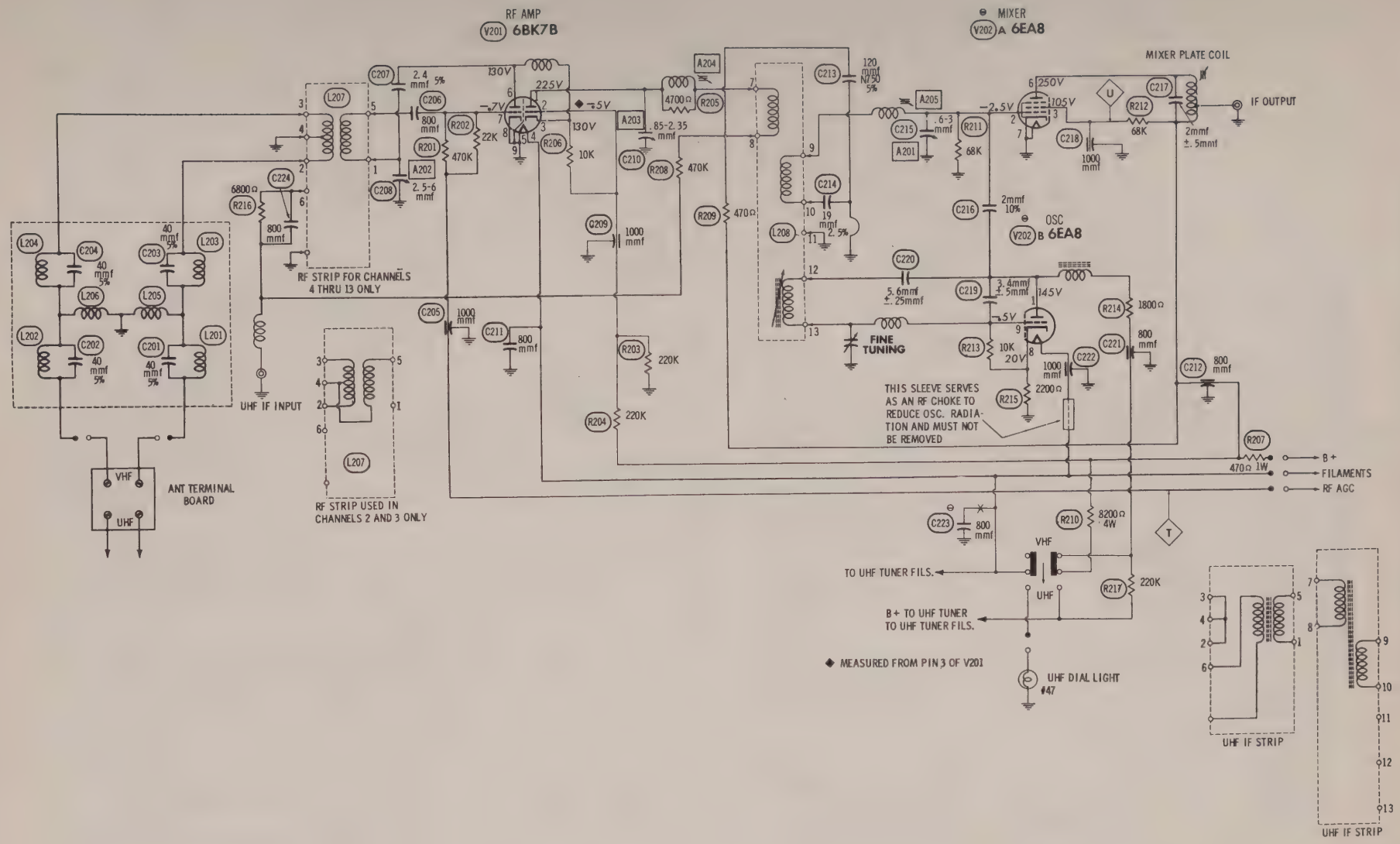


FIG.203



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VHF TUNER WITH UHF PROVISIONS 175-107

ZENITH CHASSIS 18C20, Q, U, 18C24Q

FOLDER 2

TUNER PARTS LIST AND DESCRIPTIONS

175 – 107

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BK7B	
V202	Mixer-Osc.	6EA8	6U8 *
V203	UHF Osc.	6AF4A	

* Alternate.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	40		22-2511						5%
C202	40		22-2511						5%
C203	40		22-2511						5%
C204	40		22-2511						5%
C205	1000		22-3018	EF-001	MFT-1000			503C-D1	
C206	800		22-2331	BPD-0008	DD-801	L10T8	B-382	5GA-T8	
C207	2.4		22-2596						5%
C208	2.5-60		22-2221						
C209	1000		22-3018	EF-001	MFT-1000			503C-D1	
C210	.85-2.35		22-2453						
C211	800		22-2331	BPD-0008	DD-801	L10T8	B-382	5GA-T8	
C212	800		22-2577	EF-001	MFT-1000			503C-D1	
C213	120		22-2591			L10T12	CNO-312	5TCU-T12	N750 5%
C214	19		22-2406						2.5%
C215	.6-3.0		22-2504						
C216	2		22-2434	NPO-SI 2.2		C10V22C			10%
C217	2		22-2585			C10V22C			±.5mmf
C218	1000		22-3018	EF-001	MFT-1000			503C-D1	
C219	3.4		22-2592						±.25mmf
C220	5.6		22-2499						±.25mmf
C221	800		22-2577	EF-001	MFT-1000			503C-D1	
C222	1000		22-3018	EF-001	MFT-1000			503C-D1	
C223	800		22-2331	BPD-0008	DD-801	L10T8	B-382	5GA-T8	①
C224	800		22-2331	BPD-0008	DD-801	L10T8	B-382	5GA-T8	

① Not used in some versions.

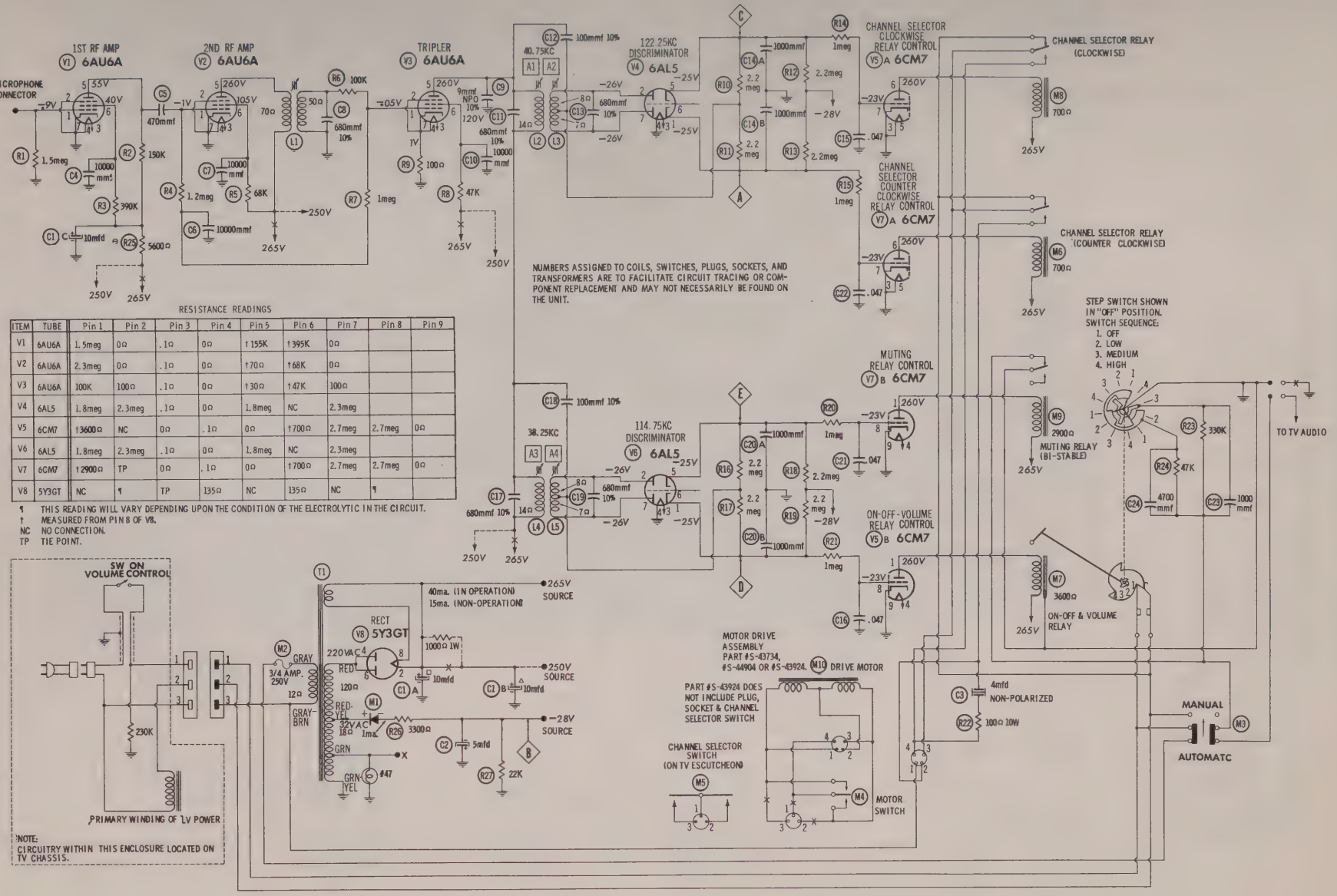
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ZENITH PART No.	NOTES
	OHMS	WATT		
R201	470K			
R202	22K			
R203	220K			
R204	220K			
R205	4700Ω			
R206	10K			
R207	470Ω	1	63-2398	
R208	470K			
R209	470Ω			
R210	8200Ω	4	63-3217	
R211	68K			
R212	68K			
R213	10K			
R214	1800Ω			
R215	2200Ω			
R216	6800Ω			
*R217	220K			

COILS (RF-IF)

ITEM No.	USE	ZENITH PART No.	NOTES
L201	Ant. Coil	20-490	
L202	"	20-490	
L203	"	20-490	
L204	"	20-490	
L205	RF Choke	20-505	
L206	RF Choke	20-505	
L207A	Ant. Coil	S-21712	Channel 2
B	"	S-21713	Channel 3
C	"	S-21714	Channel 4
D	"	S-21715	Channel 5
E	"	S-21716	Channel 6
F	"	S-19847	Channel 7
G	"	S-19848	Channel 8
H	"	S-19849	Channel 9
I	"	S-19850	Channel 10
J	"	S-19851	Channel 11
K	"	S-19852	Channel 12
L	"	S-19853	Channel 13
M	UHF IF Input	S-20990	
L208A	RF, Mixer Grid & Osc. Coils	S-21702	Channel 2
B	"	S-21703	Channel 3
L208C	RF, Mixer Grid & Osc. Coils	S-19864	Channel 4
D	"	S-19865	Channel 5
E	"	S-19866	Channel 6
F	"	S-19867	Channel 7
G	"	S-19868	Channel 8
H	"	S-19869	Channel 9
I	"	S-19870	Channel 10
J	"	S-19871	Channel 11
K	"	S-19872	Channel 12
L	"	S-19873	Channel 13
M	UHF IF	S-20992	
L209	RF Choke	20-431	
L210	Trap Coil	20-537	
L211	Trap Coil	20-538	
L212	RF Choke	S-18859	
L213	RF Choke	20-541	
L214	Mixer Plate	S-22152	
L215	RF Choke	20-722	



ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AU6A	1.5meg	0Ω	.1Ω	0Ω	†155K	†395K	0Ω		
V2	6AU6A	2.3meg	0Ω	.1Ω	0Ω	†70Ω	†68K	0Ω		
V3	6AU6A	100K	100Ω	.1Ω	0Ω	†30Ω	†47K	100Ω		
V4	6AL5	1.8meg	2.3meg	.1Ω	0Ω	1.8meg	NC	2.3meg		
V5	6CM7	†3600Ω	NC	0Ω	.1Ω	0Ω	†700Ω	2.7meg	2.7meg	0Ω
V6	6AL5	1.8meg	2.3meg	.1Ω	0Ω	1.8meg	NC	2.3meg		
V7	6CM7	†2900Ω	TP	0Ω	.1Ω	0Ω	†700Ω	2.7meg	2.7meg	0Ω
V8	5Y3GT	NC	¶	TP	135Ω	NC	135Ω	NC	¶	

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REMOTE CONTROL S-45834

ZENITH CHASSIS 18C20, Q, U, 18C24Q

REMOTE CONTROL S-45834
PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st RF Amp.	6AU6A	
V2	2nd RF Amp.	6AU6A	
V3	Tripler	6AU6A	
V4	122.25KC Discriminator	6AL5	
V5	On-Off-Volume Relay Control-Channel Selector (CW) Relay Control	6CM7	

ITEM No.	USE	TYPE	NOTES
V6	114.75KC Discriminator	6AL5	
V7	Muting Relay Control-Channel Selector (CCW) Relay Control	6CM7	
V8	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■10	350	22-3074	AFH3-27	C0210	FP330.5	TMT-27	TVL-3690	
B	▲10	350							
C	10	350							
C2	5	50	22-2941	PRS50V5	BBR5-50	TT50X5	TD-5-50	TVA-1303	
C3	4	200NP	22-2893	NP-PRS450V4	BR845 † BR845 †	TC50X † TC50X †		TVAS-1436 *	

† Connect negative leads together.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C5	470			22-6	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C6	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C7	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C8	680		10%	22-2901	1469-00068	D6-681	1R5T68		MS-368	
C9	9		NPO 10%	22-3131						
C10	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	680		10%	22-2901	1469-00068	D6-681	1R5T68		MS-368	
C12	100		10%	22-1442	1469-0001	DD-101	22R5T1	MCB235	MS-31	
C13	680		10%	22-2901	1469-00068	D6-681	1R5T68		MS-368	
C14A	1000			22-21	BPD-2X001	DD2-102	BYC6DD1	B-210	5HK-2D1	
B	1000							B-210		
C15	.047	200		22-1778	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C16	.047	200		22-1778	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C17	680		10%	22-2901	1469-00068	D6-681	1R5T68		MS-368	
C18	100		10%	22-1442	1469-0001	DD-101	22R5T1	MCB235	MS-31	
C19	680		10%	22-2901	1469-00068	D6-681	1R5T68		MS-368	
C20A	1000			22-21	BPD-2X001	DD2-102	BYC6DD1	B-210	5HK-2D1	
B	1000							B-210		
C21	.047	200		22-1778	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C22	.047	200		22-1778	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C23	1000			22-17	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C24	4700			22-14	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	ZENITH PART No.	NOTES
R1	1.5meg		63-1919	
R2	150K		63-1876	
R3	390K		63-1894	
R4	1.2meg		63-1915	
R5	68K		63-1862	
R6	100K		63-1870	
R7	1meg		63-1912	
R8	47K		63-1855	
R9	100Ω		63-1744	
R10	2.2meg		63-1925	
R11	2.2meg		63-1925	
R12	2.2meg		63-1925	
R13	2.2meg		63-1925	
R14	1meg		63-1912	

ITEM No.	RATING OHMS	RATING WATT	ZENITH PART No.	NOTES
R15	1meg		63-1912	
R16	2.2meg		63-1925	
R17	2.2meg		63-1925	
R18	2.2meg		63-1925	
R19	2.2meg		63-1925	
R20	1meg		63-1912	
R21	1meg		63-1912	
R22	100Ω	10	63-3667	
R23	330K		63-1890	
R24	47K		63-1855	
R25	5600Ω			Note 1
R26	3300Ω		63-1806	
R27	22K		63-1841	

Note 1. Some versions may use a 2200Ω in this application (Part #63-1800).

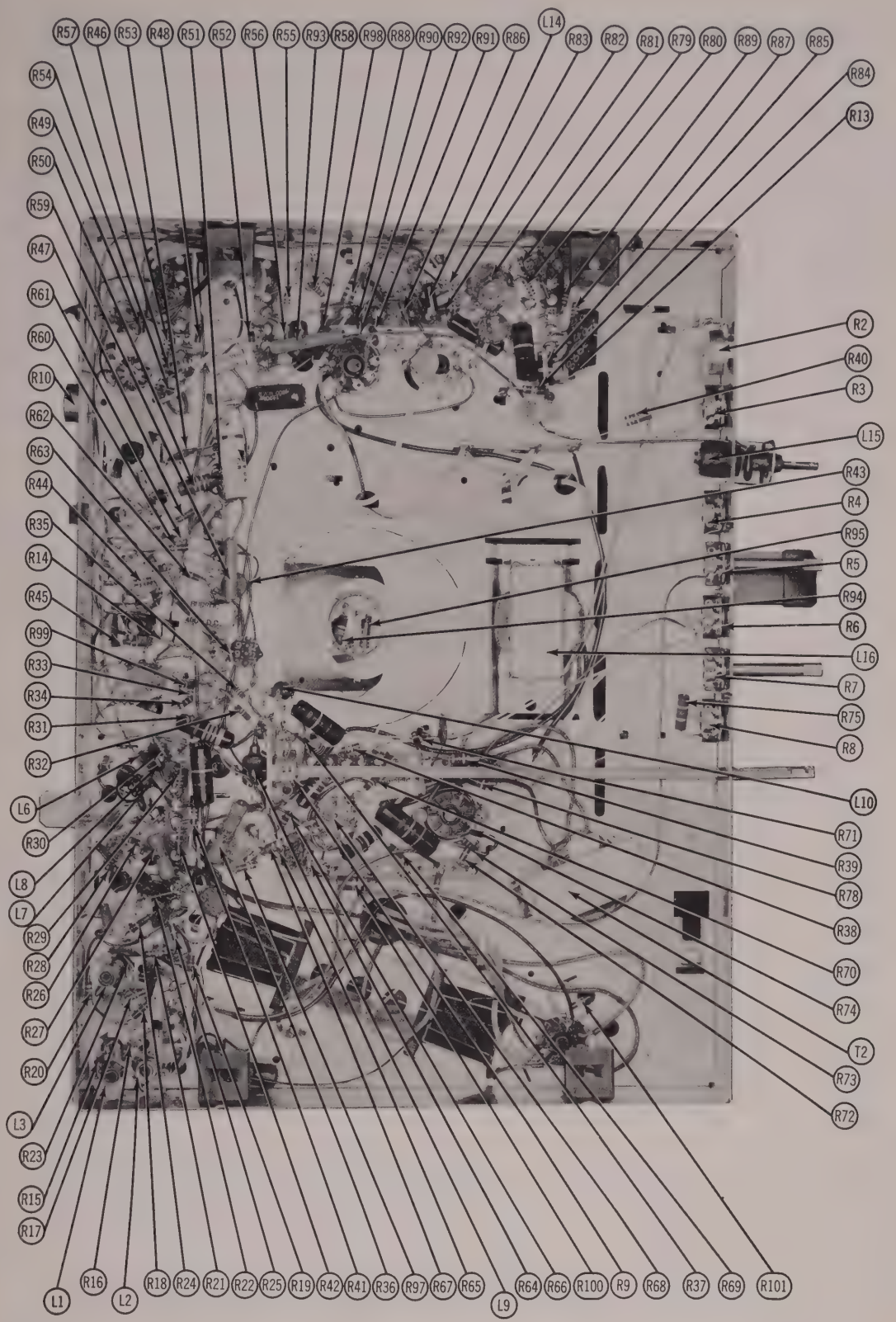
COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA ZENITH PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	39.5KC Trans.	S-43725						
L2	Discriminator	S-24788						
L3	Discriminator	S-24789						Tapped @ 7Ω
L4	Discriminator	S-24789						
L5	Discriminator	S-24789						Tapped @ 7Ω

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

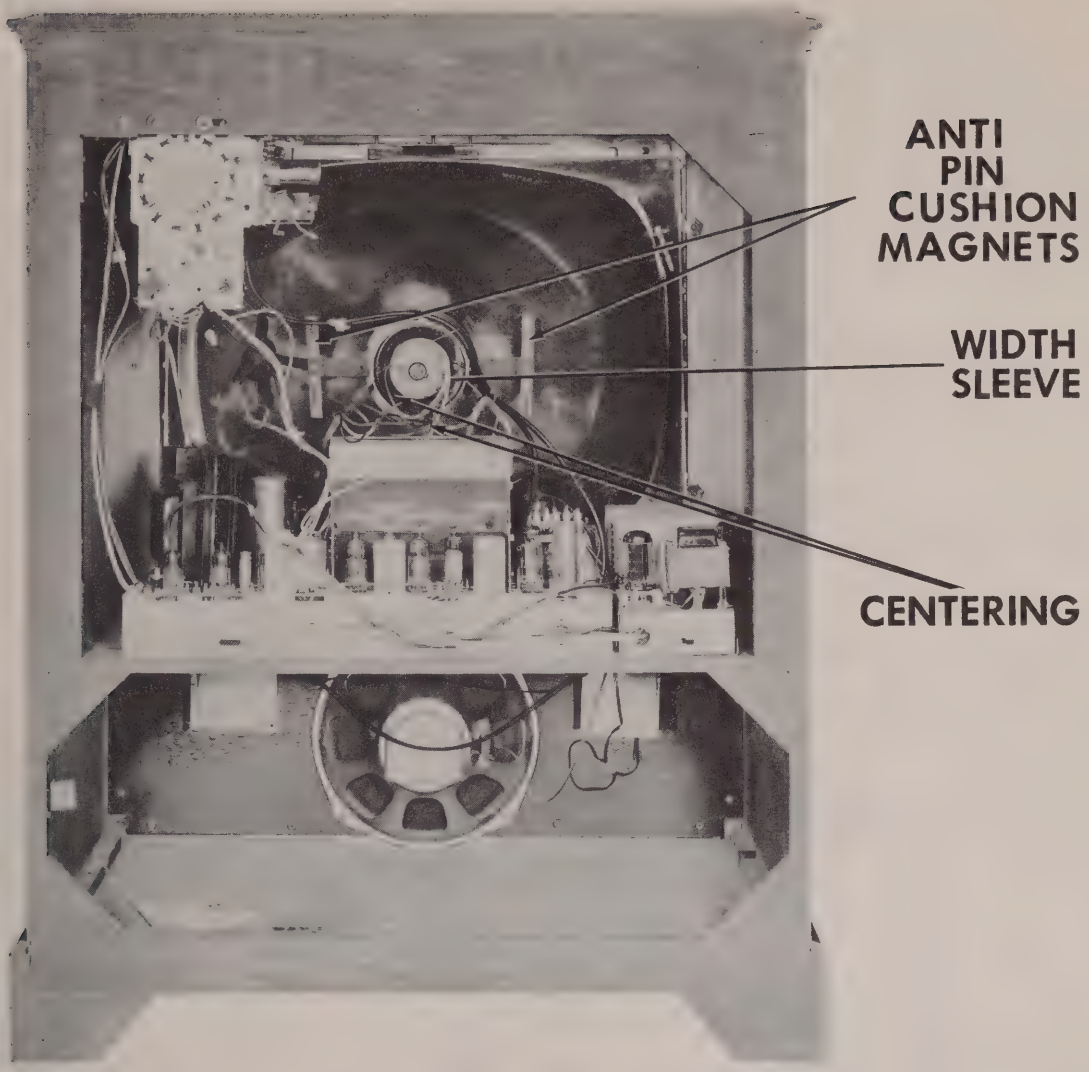
ZENITH CHASSIS 18C20, Q, U, 18C24Q

FOLDER 2



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ZENITH CHASSIS 18C20, Q, U, 18C24Q



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

The Horizontal Hold knob is equipped with a stop which limits rotation to approximately 270 degrees with the knob on the shaft. To adjust, remove the knob and adjust by turning the shaft until the picture is synchronized to the point where it is virtually impossible to disrupt horizontal synchronization when switching from channel to channel. Install the knob with its pointer centered between the stops.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	6BZ6	
V2	2nd Video IF Amp	6BZ6	
V3	3rd Vide. IF Amp	6DR6	6BZ6 *
V4	Video Output-Sound IF Amp	6EB6	
V5	AGC Keying-Noise Limiter-Sync Sep.	6BU8	
V6	Audio Det	6BN6	
V7	Audio Output	6BQ6	
V8	Vert Mult.	6CG7	
V9	Vert. Output	6CK4	
V10	Horiz. Phase Det. - Horiz. AFC	6CN7	
V11	Horiz. Osc. -Horiz. Disch.	6CG7	
V12	Horiz. Output	6DQ6A	
V13	Damper	5AU4GTA	6DA4*
V14	HV Rect.	1Y3GT	
V15	LV Rect.	5V3	5AU4 *

* Alternate.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: ZENITH PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	NOTES
V16	21CXP4 24JJP4	21CXP4 ①	21CXP4 ① 24JJP4 ③	21CXP4 ② 24JJP4 ③	① "Aluminized" ② "Silver Screen 65"

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP.	VOLT	ZENITH PART No	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	440	400	22-2971	AFH4-113-50	C0880 BR1250	FP454-8		TVLS-4805, 2*	
B	280	400							
C	20	475							
D	100	50							
C2A	44	350	23-3110	AFH3-30-30	FP329.2 TT150X4	TMD-46 TD-40-450		TVLS-3672.2*	
B	4	150			BBR4-15				
C	240	400							
C3A	240	450	22-1625	AFH3-178-25	C0920	WP339.5	TMT-111	TVL-3706	
B	250	25							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP.	VOLT	TOL	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	.068	300		23-3572	P288N-068		CUB4S8	GIM-4188	4TM-S68	
C5	470	1000		23-6	SYD-15-470	DD-472	BYA10T47	B-347	5GA-T47	
				23-2549			C10V4C		5TCCB-V48 ± .5mmf*	
C6	4		NPO ± .5mmf	23-3533				JL-210	5GA-D48 10% *	
C7	1500	1000	10%	23-17					5TCC-Q2B 5% *	
C8	18		5%	22-3035		TCZ-1S	C10Q1S	CNO-413	5TCC-Q2B 5% *	
C9	13		5%	22-3035		TCZ-1S	C10Q1S	CNO-413	5GA-D47S 10% *	
C10	.15	200		22-3141	P288N-15		GEM-2015	GTM-P15	5HK-X24	
C11	1			22-1783	NPO-SI 1.0	TCZ-1		CNO-S10	5TCCB-V1	
C12	10000			23-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C13	7		NPO ± .5mmf	23-3513						
C14	470	100	10%	22-16	DI-470	MD-471		JL-347	5GA-T47S 10% *	
C15	1000	1000	10%	22-17				JL-210	5GA-D1S 10% *	
C16	470	100	10%	22-16	DI-470	MD-471		JL-347	5GA-T47S 10% *	
C17	1000	1000	10%	22-17				JL-210	5GA-D1S 10% *	
C18	100		10%	22-5	DI-100	DD-101	L10T1	ZT-531	5GA-T1S 10% *	
C19	330		10%	22-2366	1489-00023	DB-331	5RST33	JL-333	MS-333	
C20	470		10%	22-16	DI-470	MD-471		JL-347	5GA-T47S 10% *	
C21	5		10% ± .5mmf	22-2990						
C22	T.S.			22-3743		MD-TR5			5GA-V7S	
C23	033	200	10%	22-2810	V94C2S33		FM4S33	GTM-S33	4TM-S33	
C24	47		NT5 5%	22-2467						
C25	3.3			22-2343	NPO-SI 3.3	TCZ-3R3	C10V33C	ZT-5533	5TCCB-V33	
C26	50			22-2460	SI 50	DS-500	L10Q5	ZT-545	5GA-Q5	
C27	27		10%	22-3065	NPO-SI 27	DS-270	L10Q27	CNO-427	5GA-Q2S 10% *	
C28	50		10%	22-2460	SI 50	DS-500	L10Q50	ZT-545	5GA-Q5	
C29	10		10%	22-3066	NPO-SI 10	DS-100	L10Q1	ZT-541	5GA-Q1S 10% *	
C30	.1	200		22-1777	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C31	1	200		22-1777	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C32	1000	1000	10%	22-17				JL-210	5GA-D1S 10% *	
C33	10000			23-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C34	3.9		10%				C10V4C		5TCCB-V3S8 10% *	①
C35A	1000		MP	23-2E		DD-103	BYA10S1	B-210 B-210	5HK-2DS 10% *	
B	1000		10%							
C36	470		10%	22-2480	1489-00047	DB-471	5RST47	JL-347	5GA-T47S 10% *	
C37	100		10%	22-5	DI-100	DD-101	L10T1	ZT-531	5GA-T1S 10% *	
C38	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C39	470	1000		23-6	HVB-15-470	DD-471	BYA10T47	B-347	5GA-T47	
C40	10		MIS0 10%	22-2611					5GA-V7S	
C41	T.S			22-2742				L10V8	5GA-D47S 10% *	
C42	4700		10%	22-14	DI-4700	DD-472	PM5D47	JL-347	5GA-D47S 10% *	
C43	100		NT50 5%	22-2992		DTN-100	L10T1U	CN7-310	5TCU-T1S 5% *	
C44	0068	200	10%	22-2656	V84C2D68		PM6D68	GTM-2268	5TM-D68	
C45	100000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C46	.047	200		22-1778	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C47	.22	200	10%	22-3055	V84C2P22		PM2P22	GTM-2022	2TM-P22	
C48	.1	400		22-2061	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C49	3300			22-1	BPD-0033	DD-332	BYA10D33	B-333	5HK-D33	
C50	470		10%	22-16	DI-470	MD-471		JL-347	5GA-T47S 10% *	
C51A	4700	1000		22-24	SYD-15-4700	DD-472	BYA10D47M	B-347	5HK-2D47	
B	4700	1000			SYD-15-4700	DD-472	BYA10D47M	B-347		
C52	0068	400	10%	22-2501	V84C4D68		PM6D68	GTM-4268	4TM-D68	
C53	0068	400	10%	22-2501	V84C4D68		PM6D68	GTM-4268	4TM-D68	
C54	033	400	10%	22-2625	V84C4S33		PM4S33	GTM-4133	4TM-S33	
C55	1000	1000	10%	22-17				JL-210	5GA-D1S 10% *	
C56	.1	400		22-2801	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C57A	100			22-22	BPD-0001	DD-101	L10T1	CNO-S10	5GA-T1	
B	100				BPD-0001	DD-101	L10T1	CNO-S10	5GA-T1	
C58	4700		10%	22-14	DI-4700			JL-347	5GA-D47S 10% *	
C59	4700		10%	22-14	DI-4700			JL-347	5GA-D47S 10% *	
C60	1000	1000	10%	22-17				JL-210	5GA-D1S 10% *	
C61	.047	200		22-1778	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C62	330		10%	22-2667	DI-330	DS-331	5RST33		MS-333	
C63	.1	200		22-1777	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	

CAPACITORS (cont)

ITEM No	RATING: CAP.	VOLT	TOL	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	SPRAGUE PART No.	NOTES
C64	1500		10%	23-13	DI-1500		1R5D15	JL-315	5GA-D15S 10% *	
C65	1100		10%	23-2659	1464-0011		1R5D11		5GA-D11S 10% *	
C66	4700		10%	23-14	DI-4700		PM5D47	JL-347	5GA-D47S 10% *	
C67A	1000			23-21	BPD-32M01	DD3-102	BYC10DD1	B-210 B-210	5HK-32A	
B	1000									
C68	.01	600	10%	22-1784	V84C4S1		PM6S1	GTM-411	4TM-S2	
C69	1	600		22-3126	P686N-1	DF-104	CUB6P1	8DY-447	6TM-P1	
C70	47	4000	10%	22-2558				8DY-447	50GA-Q4S5 10% *	②
C71	47	3000	10%					3DY-447	30GA-Q4T8 10% *	③
C72	75	4000	M1500 10%	22-3954						④

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use 4.3mmf 10% in this application (Part #22-3073).
② Chassis using Horizontal Output Transformer S-45706 use 75mmf 10% 4000V in this application.
③ Value may vary. Replace with original value.
④ Not used in chassis using Horizontal Output Transformer S-45706.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	63-4464				PP2S71S	Volume, Tap ⑤ 1meg ①
B	Shaft						D8-37	
C	Switch						Not Req.	Push-Pull
R2A	5meg	½	63-4032	AB-S8	B47-5meg-S	Bil-141	U6S	Fringe Lock
B	Shaft			AK-1	Not Req.	TM-1	Not Req.	
R3A	1meg	½	63-4036	AB-S4	A47-1meg-S	Bil-140	TA36L	Focus
B	Shaft			AK-1	FK8-1/4	SK-2	Not Req.	
R4A	10K	½	63-4096	AB-14	A47-10K-S	Bil-116	TA14L	AGC
B	Shaft			AK-1	FK8-1/4	SK-2	Not Req.	
R5A	2meg	½	63-4377	B-75	A47-1meg-S	QU-139	U56	Vert. Hold
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
R6A	7.5meg	½	63-3S19	AB-80	A47-7.5meg -S	QU-142	PTA75SL	Vert. Size
B	Shaft			AK-1	FK8-1	SK2	Not Req.	
R7A	250K	½	63-3572	AB-50	A47-250K-S	QU-130	U48	Brightness
B	Shaft			AK-11	KS8-3	Not Req.	Not Req.	
R8A	1500Ω	½	63-3930	AB-5	A47-1500-S	Bil-109	PTA15ZL	Vert. Lin.
B	Shaft			AK-1	FK8-1/4	SK-2	Not Req.	
R9	30K	½	63-4056				TA30L	Contrast, Tap ⑥ 10K
R10	3meg	½	63-4465				TA3L	Bass ②
R11	1meg	½	63-4466				TA1L	Treble ③
R12	750Ω	1(WW)	63-3284	WN-751 *	39-800 *	112-800 *	FL-750 *	Buzz

Note 1. Ch. 18C24Q uses 2meg tapped Volume with switch, Part #63-4010.
Note 2. Ch. 18C20, U use 3meg Bass, Part #63-4388.
Ch. 18C24Q uses 1meg Bass, Part #63-4013.
Note 3. Ch. 18C20, U use 1meg Treble, Part #63-4399.
Ch. 18C24Q uses 1meg Treble, Part #63-4014.
* Use 100Ω series resistor.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	ZENITH PART No.	NOTES
R13	2.2meg		63-1926	
R14	680K		63-1905	
R15	1000Ω		63-1788	
R16	22K		63-2848	
R17	22K		63-2848	
R18	56Ω		63-1753	
R19	1500Ω		63-1792	
R20	56K			Note 1
R21	56K			Note 1
R22	220Ω		63-1758	
R23	220Ω		63-1758	
R24	22Ω			
R25	1meg		63-1801	
R26	18K		63-1838	
R27	8200Ω	3	63-4098	
R28	470Ω		63-1771	
R29	2700Ω		63-1803	
R30	27K		63-1845	
R31	100K		63-1869	
R32	15K		63-1834	
R33	47K		63-1855	
R34	15Ω		63-1708	
R35	39K		63-1852	
R36	7500Ω	4	63-4055	
R37	3900Ω		63-1810	
R38	120K		63-1873	
R39	82K 5%	1	63-1865	
R40	470K	1	63-2149	
R41	330K		63-1891	
R42	3.3meg		63-4080	
R43	100K		63-1870	
R44	680K		63-1904	
R45	100K		63-1870	
R46	390K		63-1894	
R47	680Ω		63-1905	
R48	470Ω		63-1772	
R49	2.2meg		63-1926	
R50	27K	2	63-4093	
R51	180K		63-1876	
R52	100K		63-1869	
R53	3300Ω		63-1806	
R54	10K		63-1838	
R55	4700Ω		63-1813	
R56	150K		63-1877	
R57	470Ω	1	63-2298	

ITEM No.	RATING: OHMS	WATT	ZENITH PART No.	NOTES
R58	220Ω		63-1758	
R59	22K	2	63-1866	
R60	150K		63-1876	
R61	62K		63-1865	
R62	8.2meg		63-4189	
R63	100K		63-1870	
R64	8200Ω		63-1824	
R65	33K			
R66	6800Ω		63-1830	
R67	270K	1	63-3159	
R68	3300Ω		63-1806	
R69	1.5meg		63-1915	
R70	270K		63-1887	
R71	20K 5%		63-1839	
R72	1.5meg		63-1915	
R73	220Ω		63-1758	
R74	8200Ω		63-1824	
R75	5600Ω	1	63-3348	
R76	560Ω			
R77	560Ω			
R78	330Ω	1	63-2286	
R79	330K		63-1890	
R80	330K		63-1890	
R81	1meg		63-1911	
R82	100K		63-1869	
R83	68K		63-1862	
R84	100Ω		63-1768	
R85	10K	2	63-2145	
R86	22K		63-1843	
R87	39K		63-1852	
R88	180K	1	63-2313	
R89	18K		63-1838	
R90	330Ω		63-1744	
R91	1meg		63-1912	
R92	100Ω		63-1744	
R93	8200Ω	4	63-3602	
R94	6.8Ω	1	63-3205	Note 2
R95	22K		63-1835	
R96	1000Ω		63-1788	
R97	150K		63-1877	Note 3
R98	56K	2	63-2341	Note 4
R99	330Ω		63-1765	
R100	27K	2	63-947	
R101	230K		63-3607	

Note 1. Some versions may use 120K in this application (Part #63-1873).
Note 2. Chassis using Horizontal Output Transformer S-45706 use 5.6Ω in this application (Part #63-3253).
Note 3. Not used in chassis using Horizontal Output Transformer S-45706.
Note 4. Chassis using Horizontal Output Transformer S-45706 use 39K 2W in this application (Part #63-1457).

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	NOTES
L1A	1st Video IF	S-43882						
B	41.25MC Trap							
L2A	39.75MC Trap	S-41883						
B	47.25MC Trap							
L3A	2nd Video IF	S-45677						
B	47.25MC Trap							
L4	3rd Video IF	S-45539	17-4523 *	17-4523 *	TV-130 *	6234 *	VF-3 *	
L5	4th Video IF	S-45679						8ish
L6	Series Peaking Coil	S-43679	19-3075	19-3075	TV-186	6172		17ish
L7	Shunt Peaking Coil	S-43619	19-3180	19-3180	TV-184	6180	VP-5	6.7ish
L8	RF Choke	S-21888	19-1004	19-1004	RC-565	4810		350ish
L9	Shunt Peaking Coil	S-18011	19-3250	19-3250	TV-185	6181	VP-5	350ish
L10	Series Peaking Coil	S-43618	19-3180 ▲	19-3180 ▲	TV-184 ▲	6180 ▲	VP-5 ▲	170ish ①
L11	1st Sound IF	S-43125			TV-120			
L12	2nd Sound IF	S-43717	17-1021 ■	17-1021 ■	TV-149			
L13	Quadrature Coil	S-19030	20-1005 *	20-1005 *	TV-121	1680 *		
L14	Resonant Choke	S-22777						10, 4ish

① Wound on 5600Ω resistor. * Drill new mounting hole. ▲ Parallel with 5600Ω resistor. ■ Enlarge mounting hold.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L15	165Ω		S-19743	HS-6	TV-169	6324		HS-6	Horiz. Osc. tapped ⑤ 65Ω

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 (+)	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No	Triad PART No
L16	.250A	52Ω	1.4 Hy.	95-1559	28C44	C-2296		C-2326	28C44	C-17X

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No	Thordarson PART No.	Triad PART No.
T1	117V	530VCT @ 1.9A	5V @ 3.8A	95-1561						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 10.4A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No	Ram PART No.	Rogers PART No.	Stancor PART No	Thordarson PART No	Triad PART No.
T2	Vert. Output	95-1656		A-3033 ①	V314	VO38	A-8146 ①		A-18X ②
T3	Yoke-Horiz. (14MH)	95-1654	Y-39	MDF-81	Y90712/47	PCM045	DY-13A	Y-39	Y-40 ④
	(90°)-Vert. (44MH)	③		④ ⑤	④ ⑤	④ ⑤	④ ⑤	⑤	NW3 ⑤
	Rear Cover & Centering Device	S-23237							YC-1
T4	Horiz. Output	S-41988		HVO-110 ⑥ *		EFR180	HO-369 ⑥ *		
	Alt. Horiz. Output	S-45706							

② Cut and tape green lead.
③ Use S.S to 1 turns ratio. Drill new mounting hole(s).
④ Connect yoke #2 to terminal #3 of T4, yoke #7 to terminal #1 of T4, connect 1000Ω ½ watt resistor from yoke #1 and #3 to terminal #2 of T4.
⑤ Use original rear cover, centering device and horizontal yoke damping capacitor, if necessary. Cut and form a piece of .010 gauge fish paper inside the yoke itself and support with an acetate cement, to provide an insulation between width sleeve and the yoke proper.
⑥ Connect yoke #2 to terminal #3 of T4, yoke #1 to terminal #1 of T4, connect 1000Ω ½ watt resistor from yoke #2 and #7 to terminal #2 of T4.
⑦ Use original mounting bracket.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Ment Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	5		7			7		
	4		1			6		
	3		2			5		
	2		3			4		
	1		8			1		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Ment PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	7500Ω	3-4Ω	95-1613	28S48 ①	A-3023 ①	AU-804 ①	A-3849 ①	28S48 ①	8-9X	① Drill new mounting hole.

ZENITH CHASSIS 18C20, Q, U, 18C24Q

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	10"	PM	3-4Ω	49-832 ①	10A6A	① Used in Models C2358E, EU, R, RU, W, WU, C3010E, H, R, C3014H, R
SP2	3"	Electrostatic		S-23829 ②		② Two used in all models except C2330E, EU, R, RU,
SP3	3"	Electrostatic		S-23829 ②		③ Two used in Models C2330E, EU, R, RU
	8"	PM	6-8Ω	49-827 ③	8A21Z6.4	④ Two used in Models C3012H, R, C3013H, C4012H, R
		PM		49-830 ④		⑤ Two used in Models C2359E, EU, W, WU, C2360M, MU, R, RU, C3011E, W, Y, C4007E, R
		PM		49-821 ⑤		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	N	.7A 250V S/B	136-38	62-21	333.750 (N-7/10A-250V-S/B)	346010	N 7/10	HN 1/2 to 3/4

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ZENITH PART No.	CBS PART No.	SYLVANIA PART No.	
M2		103-23	1N64	1N295	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Tuner	175-108	VHF
	Tuner	175-107	VHF with UHF with UHF provisions
	Tuner	175-8	UHF
M4	Switch	S-41498	Motor Switch Assembly
M5	Switch	S-44018	Channel Selector (On TV Escutcheon)
M6	Motor	141-148	
M7	Width Sleeve		
M8	Magnet	S-46005	Anti-Pincushion (2 used)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	192-275	Models C2330E, EU, R, RU, C2358E, EU, R, RU, W, WU, C2359E, EU, W, WU, C2360M, MU, R, RU
Safety Glass	192-263	Models C3010E, H, R, C3011E, W, Y, C3012H, R, C3013H, C3014H, R
Safety Glass	192-244	Models C4007E, R, C4012H, R
Knob	S-45712	VHF Channel Selector, Models C2330E, EU, R, RU, C2358E, EU, R, RU, W, WU, C2359E, EU, W, WU, C2360M, MU, R, RU
Knob	46-2003	VHF Channel Selector, Models C3010E, H, R, C3011E, W, Y, C3012H, R, C3013H, C3014H, R
Knob	S-43769	VHF Channel Selector, Models C4007E, R, C4012H, R
Knob	S-45733	UHF Channel Selector, Models C2330EU, RU, C2358EU, RU, WU, C2359EU, WU, C2360MU, RU
Knob	S-43768	VHF Fine Tuning, Models C2330E, EU, R, RU, C2359E, EU, W, WU, C2360M,MU, R, RU, C4007E, R, C4012H, R
Knob	S-43712	VHF Fine Tuning, Models C2358E, EU, R, RU, W, WU
Knob	46-2035	VHF Fine Tuning, Models C3010E, H, R, C3011E, W, Y, C3012H, R, C3013H, C3014H, R
Knob	S-45716	Volume, All Models except C4007E, R, C4012H, R
Knob	46-1970	Volume, Models C4007E, R, C4012H, R
Knob	S-43672	Brightness, Models C2330E, EU, C2360M, MU, R, RU, C3010E, H, R, C3011E, W, Y, C3012H, R, C3013H, C3014H, R, C4007E, R, C4012H, R
Knob	S-41482	Brightness, Models C2330R, RU, C2358E, EU, R, RU, W, WU, C2359E, EU, W, WU
Knob	S-41482	Contrast, All Models except C2330R, RU, C2358E, EU, R, RU, W, WU, C2359E, EU, W, WU
Knob	S-46154	Contrast, Models C2330R, RU, C2358E, EU, R, RU, W, WU, C2359E, EU, W, WU
Knob	S-43672	Vert. Hold
Knob	46-1118	Horiz. Hold
Knob	S-46154	Tone, All Models except C2330R, RU, C2358E, EU, R, RU, W, WU, C2359E, EU, W, WU
Knob	S-45708	Tone, Models C2330R, RU
Knob	S-45852	Tone, Models C2358E, EU, R, RU, W, WU
Knob	S-45809	Tone, Models C2359E, EU, W, WU

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

REMOTE CONTROL S-45834
PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .50A	220V @ .040A tap @ 32V @ .001A tap @ 6.3V @ 2.8A	5V @ 2A	95-1612						

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	ZENITH PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.001A	212-21 ①					① Selenium Type.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	.750A 250V S/B	136-41	83-3027	312.750 (3AG-3/4A-250V-S/B)	356001	MDL 3/4	4406

MISCELLANEOUS

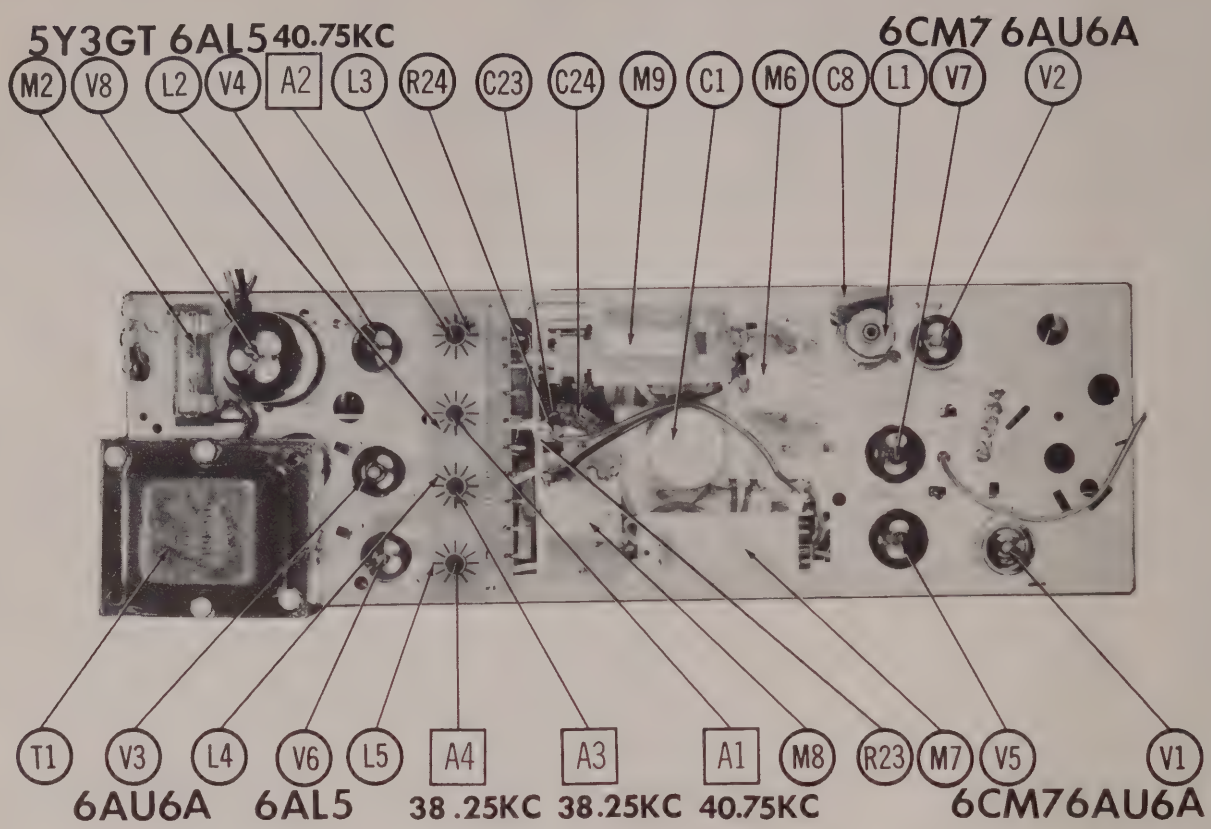
ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Switch	85-580	Auto-Manual (DPDT Slide Type)
M4	Switch	S-41498	Motor
M5	Switch	S-44018	Channel Selector (On TV escutcheon)
M6	Relay	195-5	Channel Selector (CCW)
M7	Relay	S-43723	Off-On-Volume (Step, Includes Switches)
M8	Relay	195-5	Channel Selector (CW)
M9	Relay	S-42705	Muting (Bi-Stable)
M10	Motor	141-148	
	Microphone Assy.	S-45443	

ALIGNMENT INSTRUCTIONS

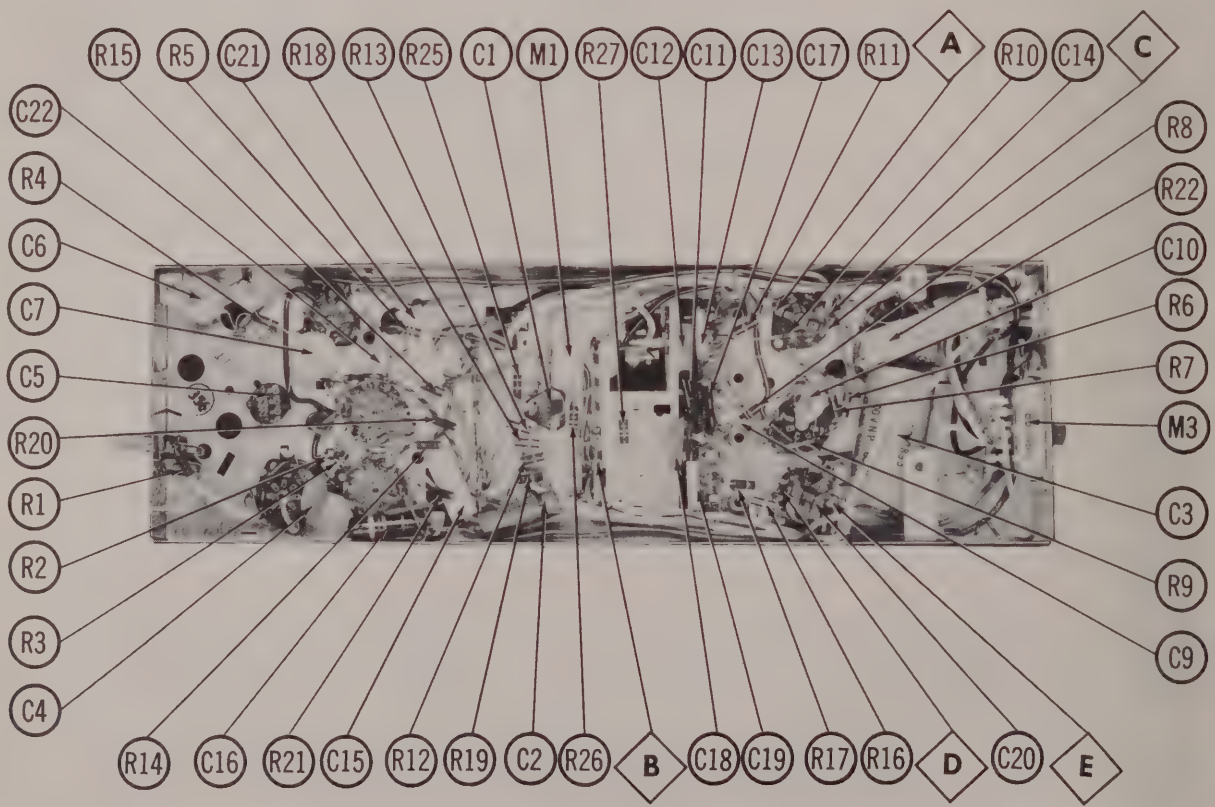
REMOTE CONTROL S-45834

Remove the 2 Relay Control tubes.
Use only enough generator output to provide a usable indication on VTVM.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

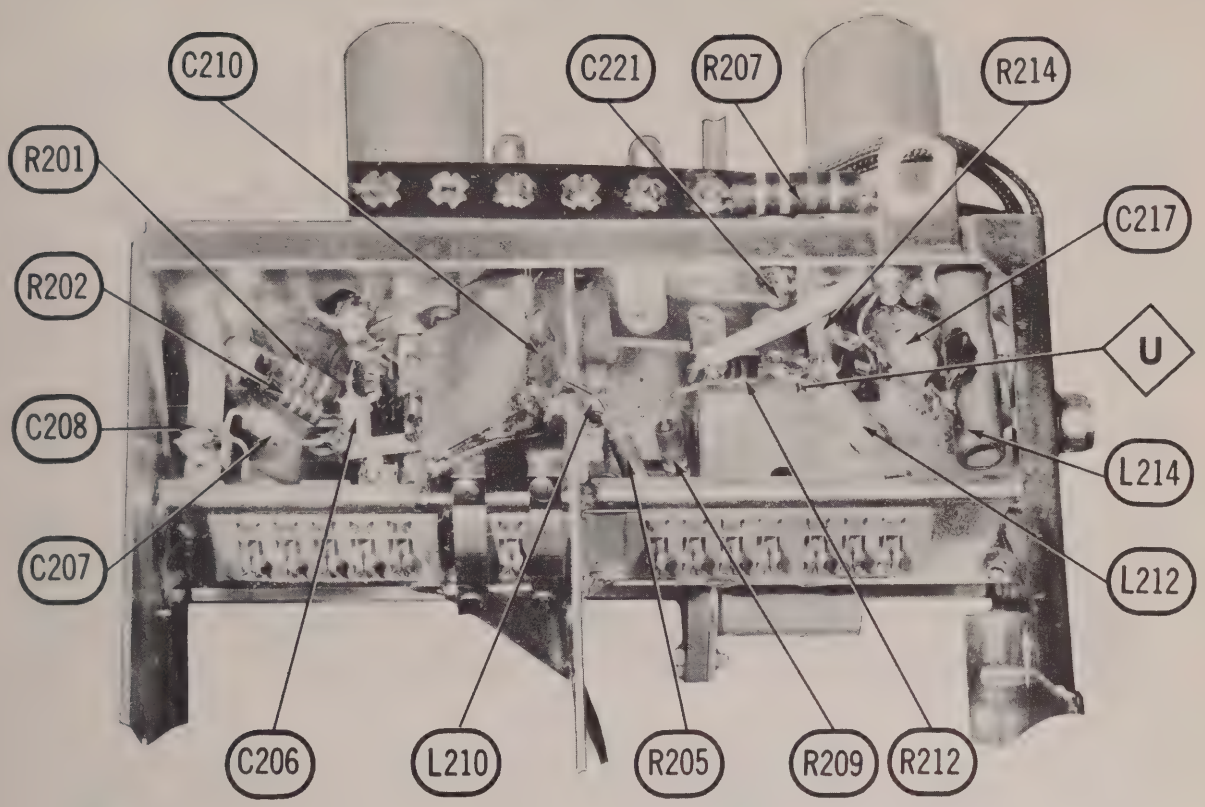
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.01mfd	High side to pin 1 (grid) of 1st RF Amp. Low side to chassis.	40.75KC (Unmod)		DC probe thru 1meg to point (A). Common to point (B).	A1	Adjust for maximum deflection.
2.	"	"	"		DC probe thru 1meg to point (A). Common to point (C).	A2	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
3.	Use transmitter used with unit as signal source. Place approximately 4 inches in front of microphone and repeatedly depress corresponding key to provide the signal. Connect the negative lead of the VTVM to point (B). While depressing transmitter keep checking voltages at points (A) and (C). If more than 25% difference retouch A2 SLIGHTLY to bring within tolerance.						
4.	.01mfd	High side to pin 1 (grid) of 1st RF Amp. Low side to chassis.	38.25KC (Unmod)		DC probe thru 1meg to point (D). Common to point (B).	A3	Adjust for maximum deflection.
5.	"	"	"		DC probe thru 1meg to point (D). Common to point (E).	A4	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
6.	Using transmitter used with unit as signal source. Place approximately 4 inches in front of microphone and repeatedly depress corresponding key to provide the signal. Connect the negative lead of the VTVM to point (B). While depressing transmitter keep checking voltages at points (D) and (E). If more than 25% difference retouch A4 SLIGHTLY to bring within tolerance.						



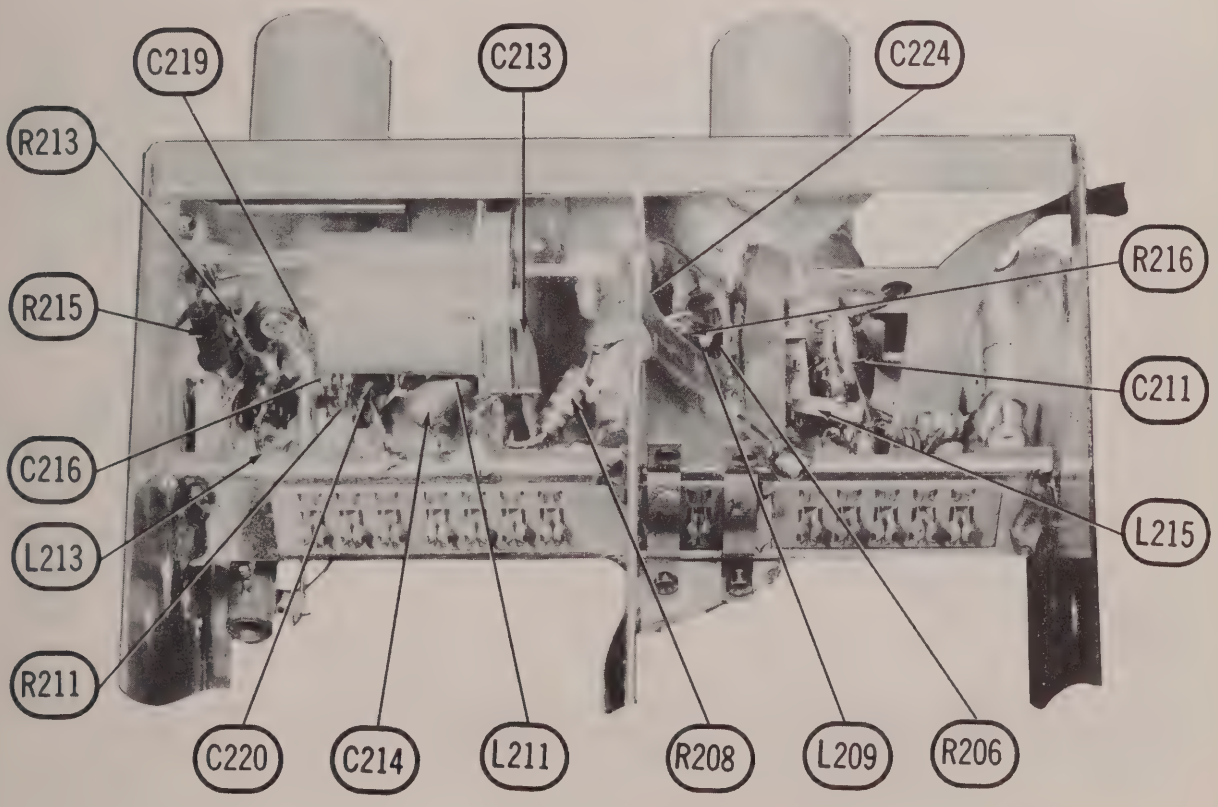
REMOTE CONTROL S-45834 - TOP VIEW



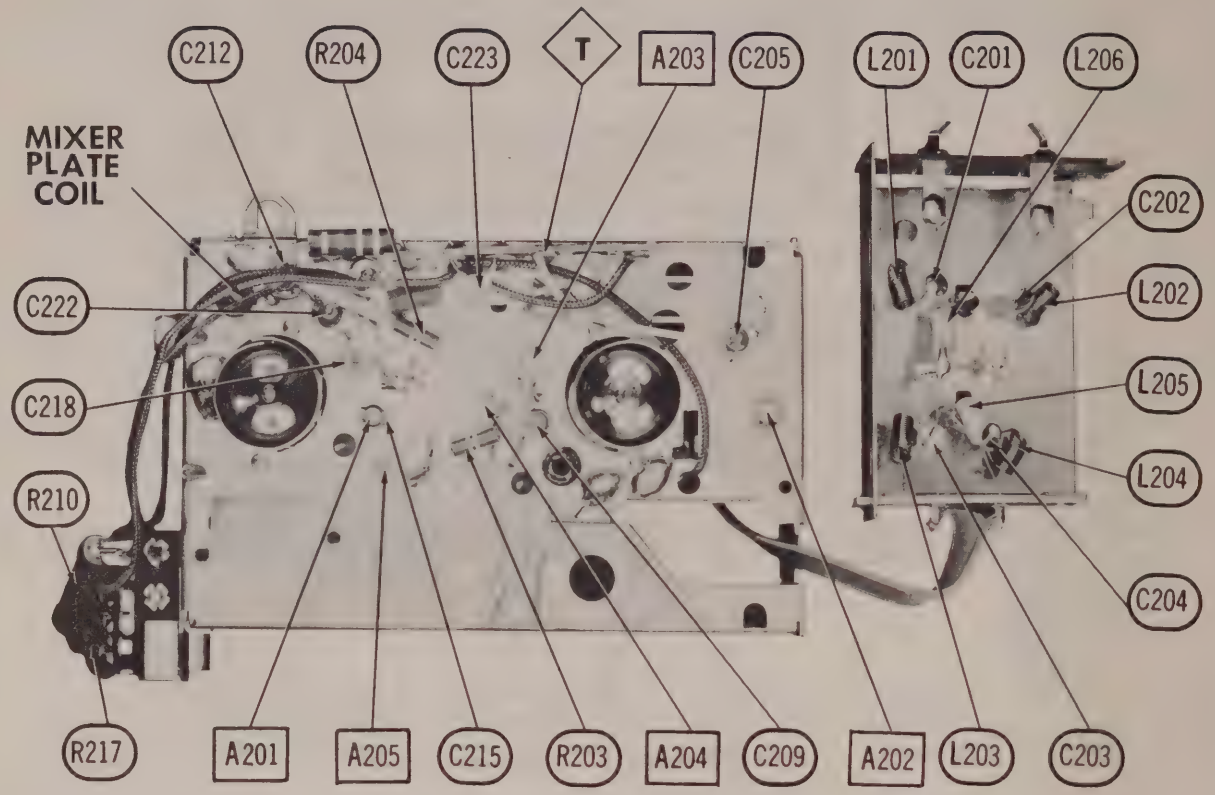
REMOTE CONTROL S-45834 - BOTTOM VIEW



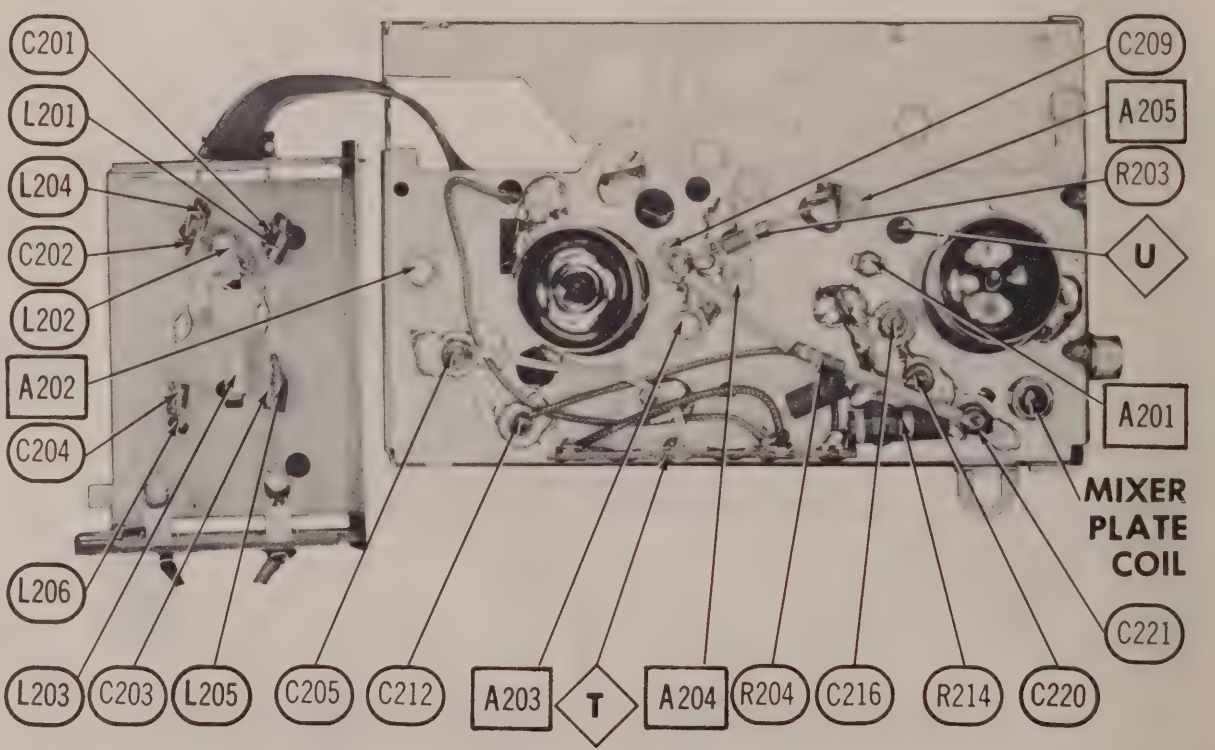
TUNER 175-107 - LEFT SIDE



TUNER 175-107 - RIGHT SIDE



TUNER 175-107 - TOP VIEW



TUNER 175-108 - TOP VIEW

TUNER PARTS LIST AND DESCRIPTIONS

175–108

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BK7B	
V202	Mixer-Osc.	6EA8	6U8 *

* Alternate.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	40		22-2511		D6-400				5%
C202	40		22-2511		D6-400				5%
C203	40		22-2511		D6-400				5%
C204	40		22-2511		D6-400				5%
C205	1000		22-3018	EF-001	MFT-1000			503C-D1	
C206	800		22-2331	BPD-0008	DD-801	L10T8		5GA-T8	
C207	2.4		22-2596						5%
C208	2.5-6		22-2221						
C209	1000		22-3018	EF-001	MFT-1000			503C-D1	
C210	.85-2.3		22-2453						
C211	800		22-2331	BPD-0008	DD-801	L10T8		5GA-T8	
C212	1000		22-3018	EF-001	MFT-1000			503C-D1	
C213	120		22-2591		DTN-120				5%
C214	19		22-2406						2.5%
C125	.6-3		22-2504						
C216	1000		22-3018	EF-001	MFT-1000			503C-D1	
C217	2		22-2434						10%
C218	3.4		22-2592						±.25mmf
C219	5.6		22-2499						±.25mmf
C220	1000		22-3018	EF-001	MFT-1000			503C-D1	
C221	800		22-2577						
C222									
C223	2		22-2585						±.5mmf

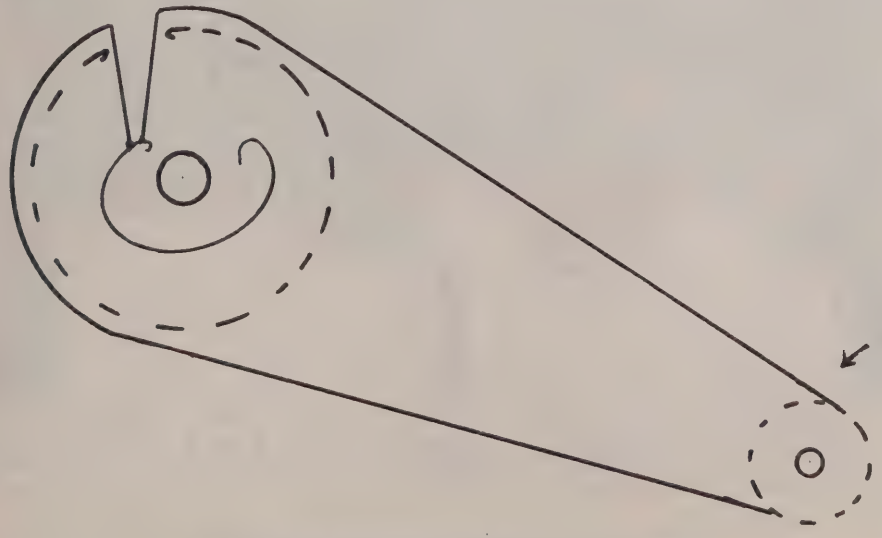
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

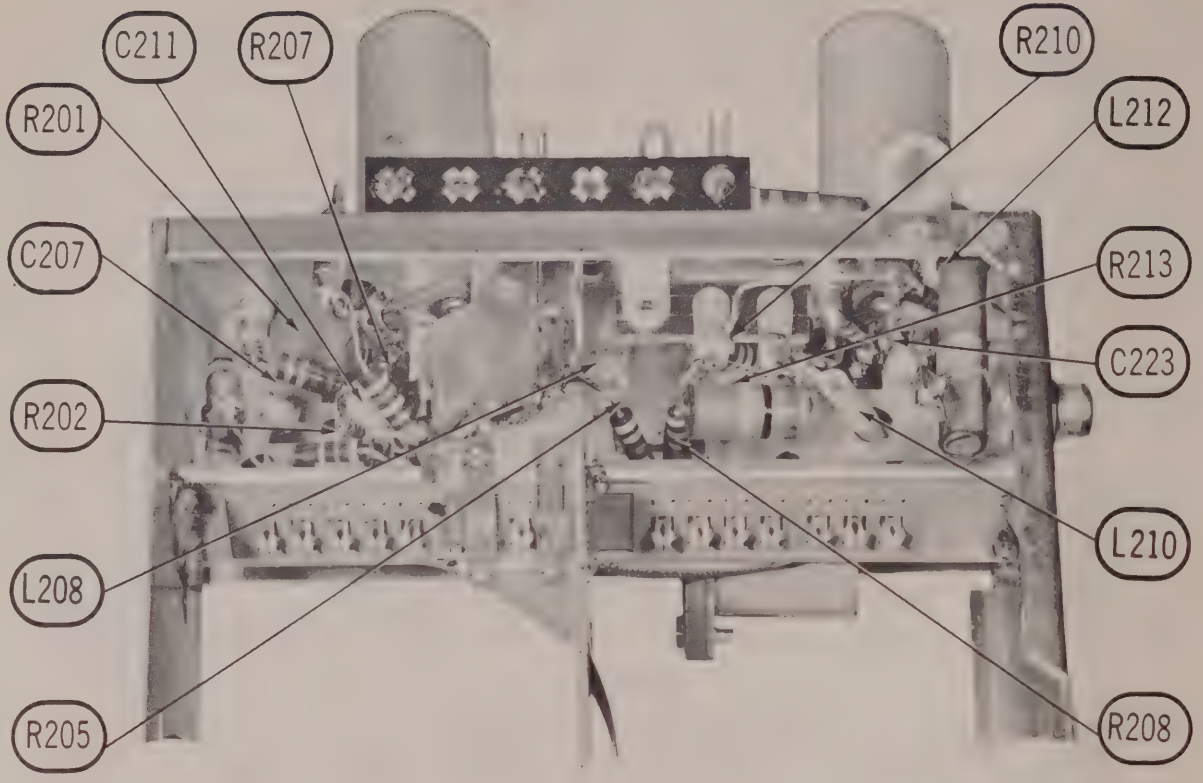
ITEM No.	RATING		ZENITH PART No.	NOTES
	OHMS	WATT		
R201	22K			
R202	47K			
R203	220K			
R204	220K			
R205	4700Ω			
R206	10K			
R207	470K			
R208	470Ω			
R209	68K			
R210	68K			
R211	10K			
R212	2200Ω			
R213	10K	2	63-3170	
R214	470Ω	1	63-2398	

COILS (RF-IF)

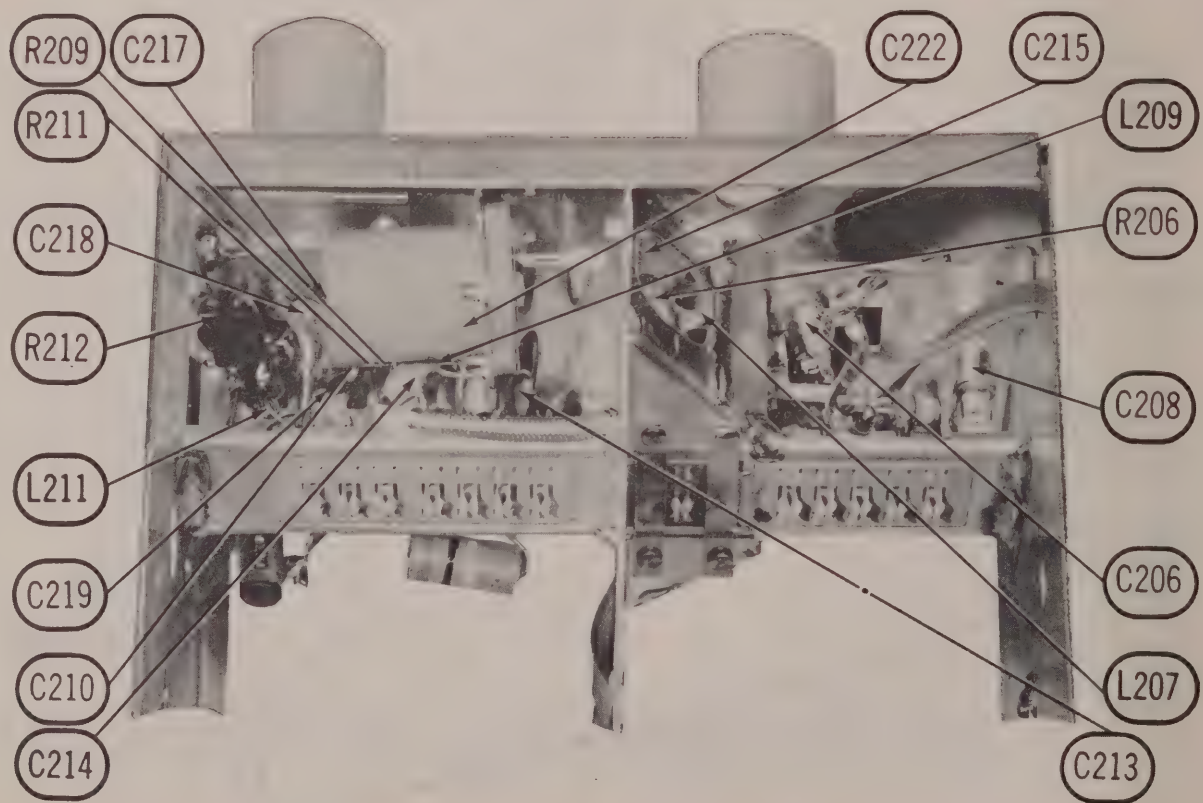
ITEM No.	USE	ZENITH PART No.	NOTES
L201	IF Trap Coil	20-490	
L202	IF Trap Coil	20-505	
L203	IF Trap Coil	20-505	
L204	IF Trap Coil	20-490	
L205	IF Trap Coil	20-490	
L206	IF Trap Coil	20-490	
L207	Neut. Coil	20-431	
L208	RF Coil	20-537	
L209	Mixer Grid Coil	20-538	
L210	RF Choke	S-18859	
L211	Osc. Coil	20-541	
L212	Mixer Plate Coil	S-22702	



FINE TUNING DRIVE CORD

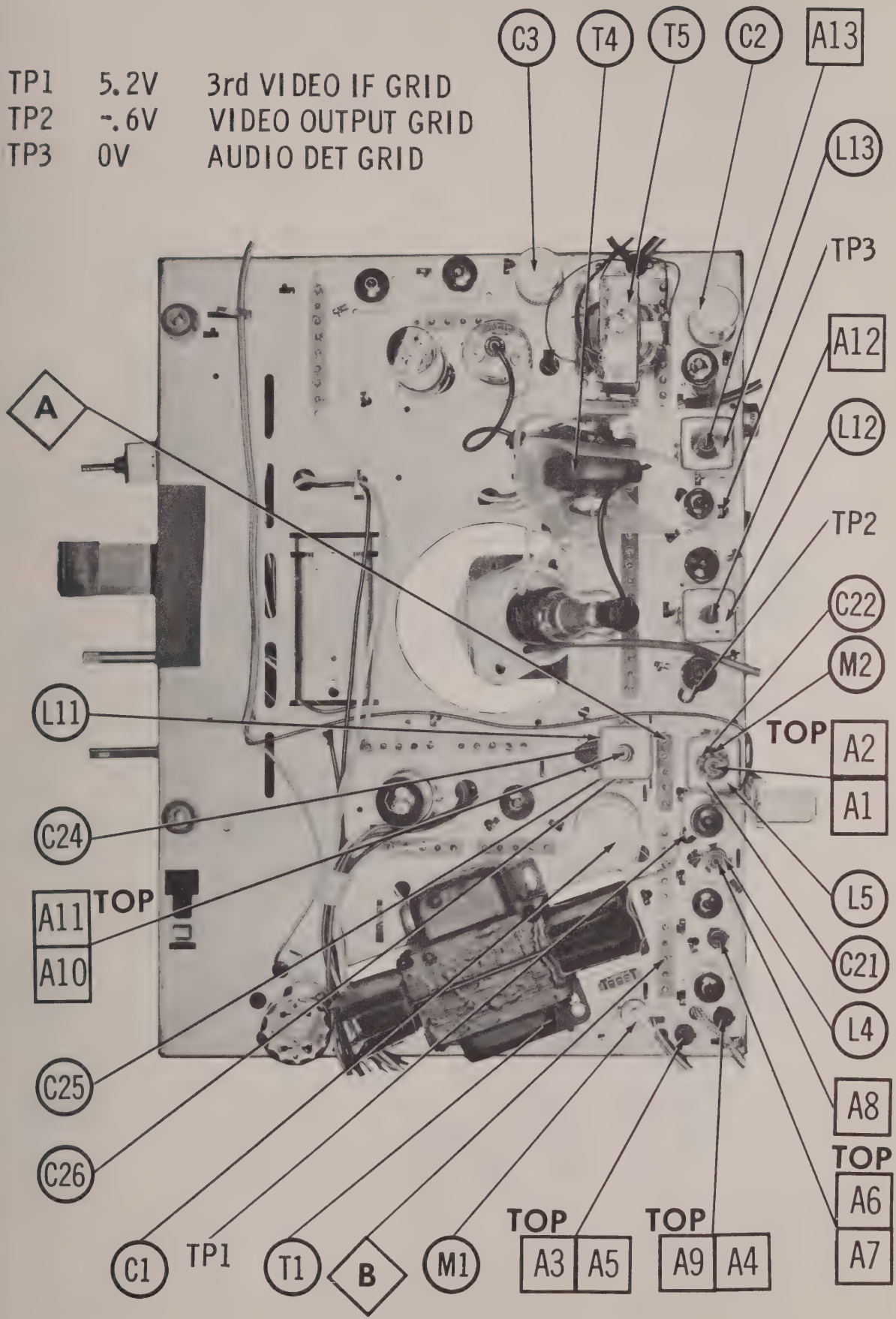


TUNER 175-108 - LEFT SIDE



TUNER 175-108 - RIGHT SIDE

TP1	5.2V	3rd VIDEO IF GRID
TP2	-.6V	VIDEO OUTPUT GRID
TP3	0V	AUDIO DET GRID



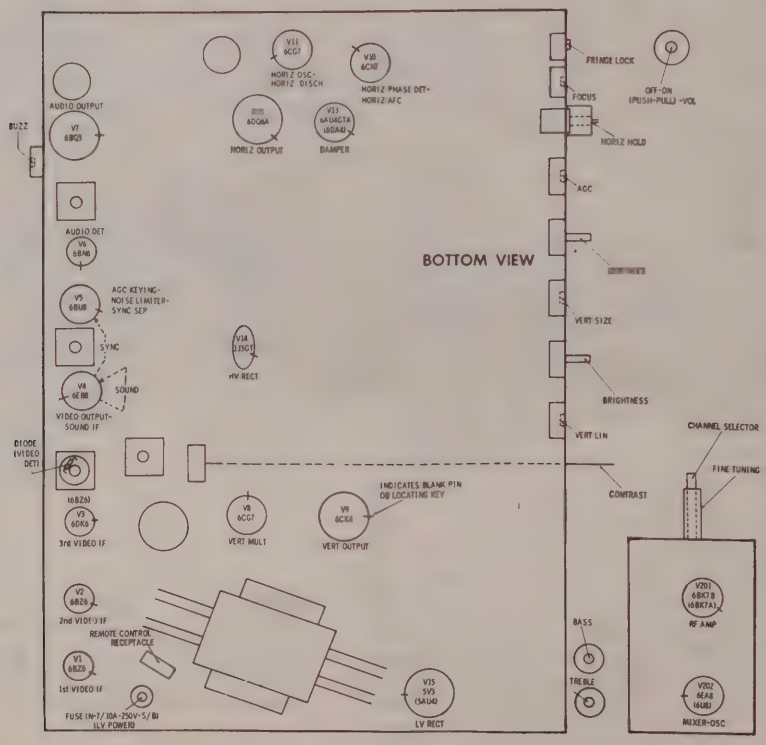
CHASSIS TOP VIEW

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	1.4meg	1500Ω	.1Ω	0Ω	▲240Ω	▲240Ω	1500Ω		
V2	6BZ6	35K	▲22Ω	.1Ω	0Ω	†220Ω	†220Ω	INF		
V3	6DK6	18K	470Ω	.1Ω	0Ω	†8200Ω	†8200Ω	0Ω		
V4	6EB8	0Ω	100K	†150K	.1Ω	0Ω	15Ω	2700Ω	†27K	†6000Ω
V5	6BU8	● 7500Ω	†22K	680K	.1Ω	0Ω	90K	●†500K	†80K	†8.2meg
V6	6BN6	● 100Ω	.2Ω	.1Ω	0Ω	†27K	4.6Ω	†390K		
V7	6BQ5	13K	13K	220Ω	.1Ω	0Ω	NC	†1100Ω	NC	†470Ω
V8	6CG7	● †2.2meg	● 2.5meg	0Ω	0Ω	.1Ω	†325K	6000Ω	3300Ω	NC
V9	6CK4	1.2meg	0Ω	1.2meg	NC	†650Ω	NC	.1Ω	●1000Ω	
V10	6CN7	0Ω	660K	330K	0Ω	.1Ω	390Ω	1.6meg	†68K	0Ω
V11	6CG7	†235K	39K	0Ω	0Ω	.1Ω	†0Ω	32K	10K	NC
V12	6DQ6A	NC	.1Ω	TP	†8300Ω	1meg	TP	0Ω	0Ω	TOP CAP †11Ω
V13	6AU4GTA	NC	NC	¶250K	NC	†.8Ω	NC	0Ω	.1Ω	
V14	1J3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †280Ω
V15	5V3	NC	¶	TP	25Ω	NC	23Ω	TP	¶	
V16	21CXP4	.1Ω	0Ω	PIN 6 ●†1.2meg	PIN 10 16K	PIN 11 ●160K	PIN 12 0Ω			
V201	6BK7B	†950Ω	120K	130K	0Ω	.1Ω	130K	3meg	0Ω	0Ω
V202	6EA8	†10K	68K	†68K	.1Ω	0Ω	†470Ω	0Ω	2200Ω	12K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 260V SOURCE.
† MEASURED FROM PIN 3 OF V13.
▲ MEASURED FROM PIN 7 OF V2.

NC NO CONNECTION.
TP TIE POINT.

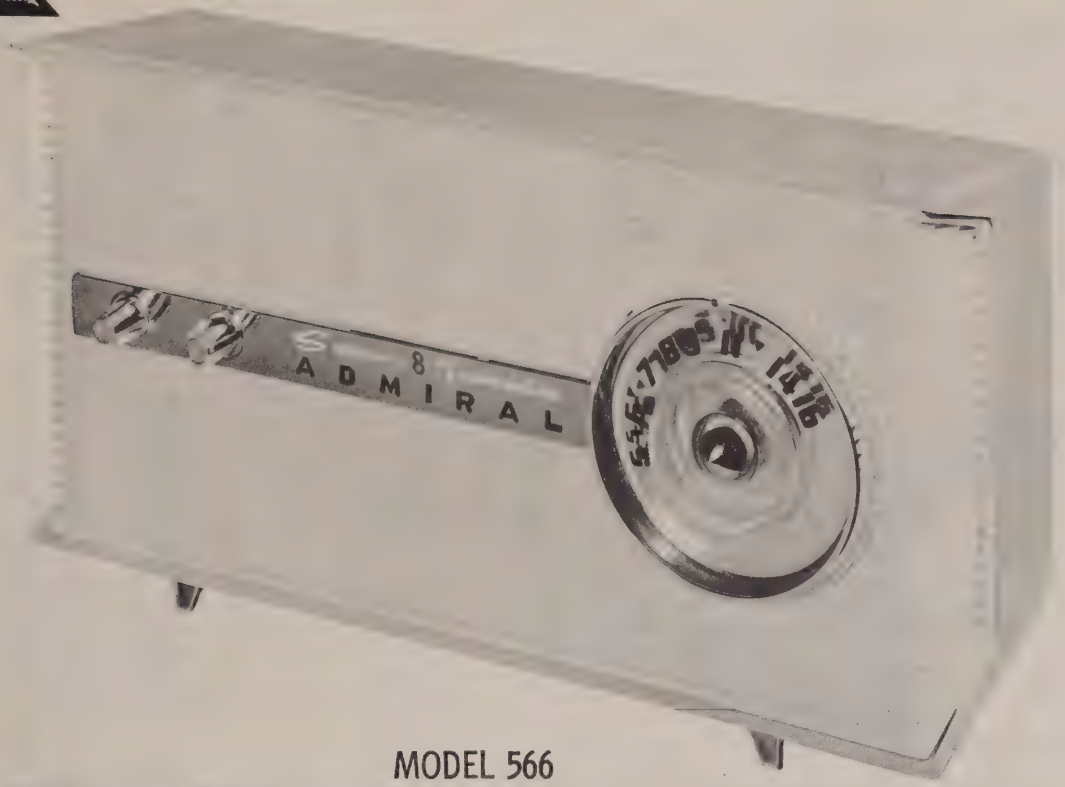


TUBE PLACEMENT CHART

PHOTOFACT* Folder with CIRCUITRACE*

ADMIRAL MODELS 561, 566, 811, 816 (Ch. 8S1, 8S1A)

ADMIRAL MODELS 561, 566, 811, 816 (Ch. 8S1, 8S1A)



MODEL 566

TRADE NAME	Admiral Models 561, 566 (Ch. 8S1), 811, 816 (Ch. 8S1A)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	Battery Operated Transistorized AM Portable Receiver (Models 811 and 816 are Clock Versions)
POWER SUPPLY	9 Volts DC (Receiver), 1.5 Volts DC (Clock)
RATING	7.3MA @ 9 Volts DC (No Signal, Min. Volume)
	10.5MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3, A4 ... GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544
A5, A6 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1620KC	"	"	A5	Adjust for maximum output.
3.		"	1400KC	1400KC signal	"	A6	Adjust for maximum output while rocking tuning gang. Repeat steps 2 and 3.

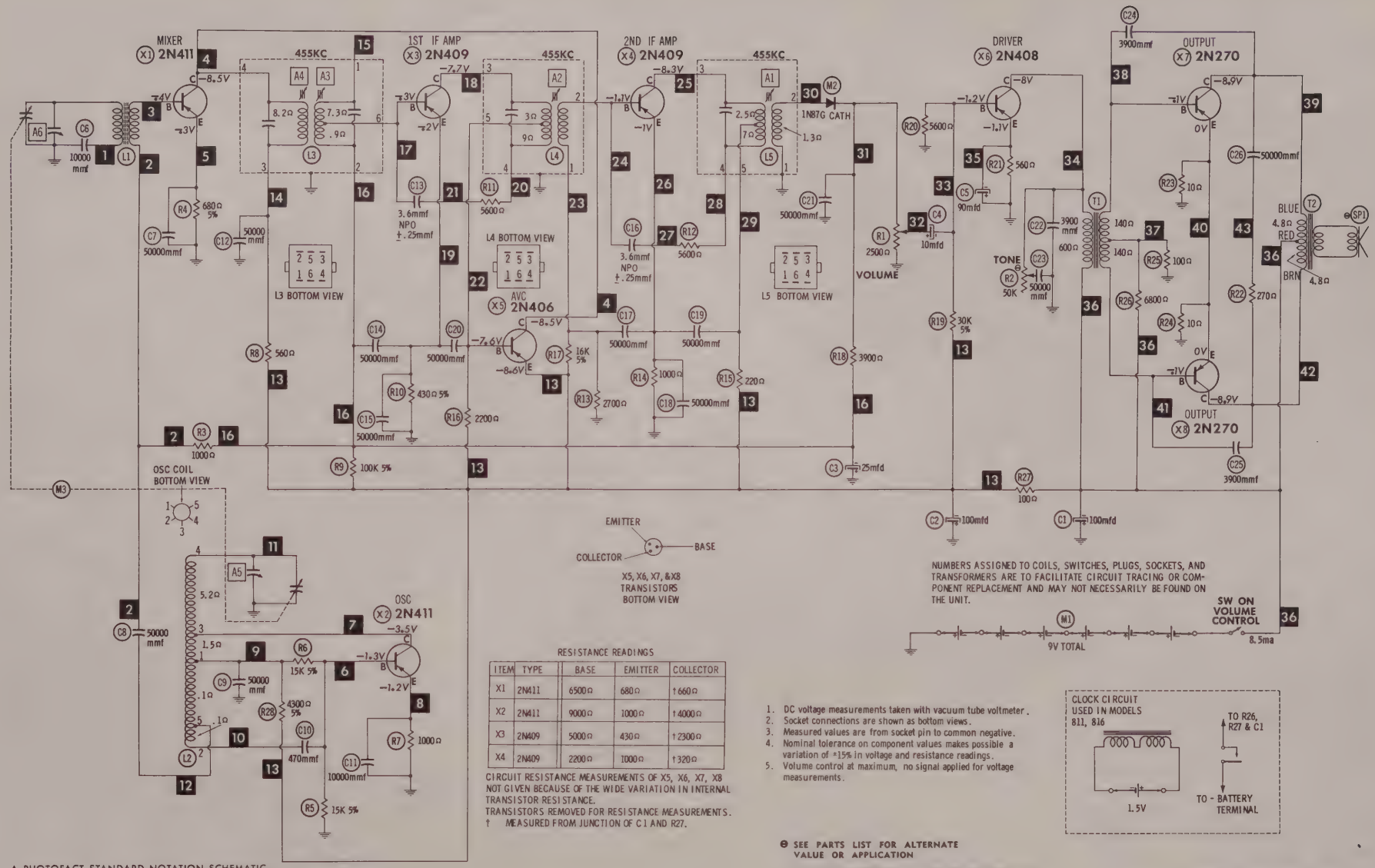
DISASSEMBLY

1. Remove 2 screws near front of cabinet front.
2. Remove 2 screws from top of cabinet back.
3. Remove front panel (with components) from cabinet.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of J138

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N411	6500Ω	680Ω	†660Ω
X2	2N411	9000Ω	1000Ω	†4000Ω
X3	2N409	5000Ω	430Ω	†2300Ω
X4	2N409	2200Ω	1000Ω	†320Ω

CIRCUIT RESISTANCE MEASUREMENTS OF X5, X6, X7, X8 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF C1 AND R27.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

CLOCK CIRCUIT
USED IN MODELS
811, 816

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE®

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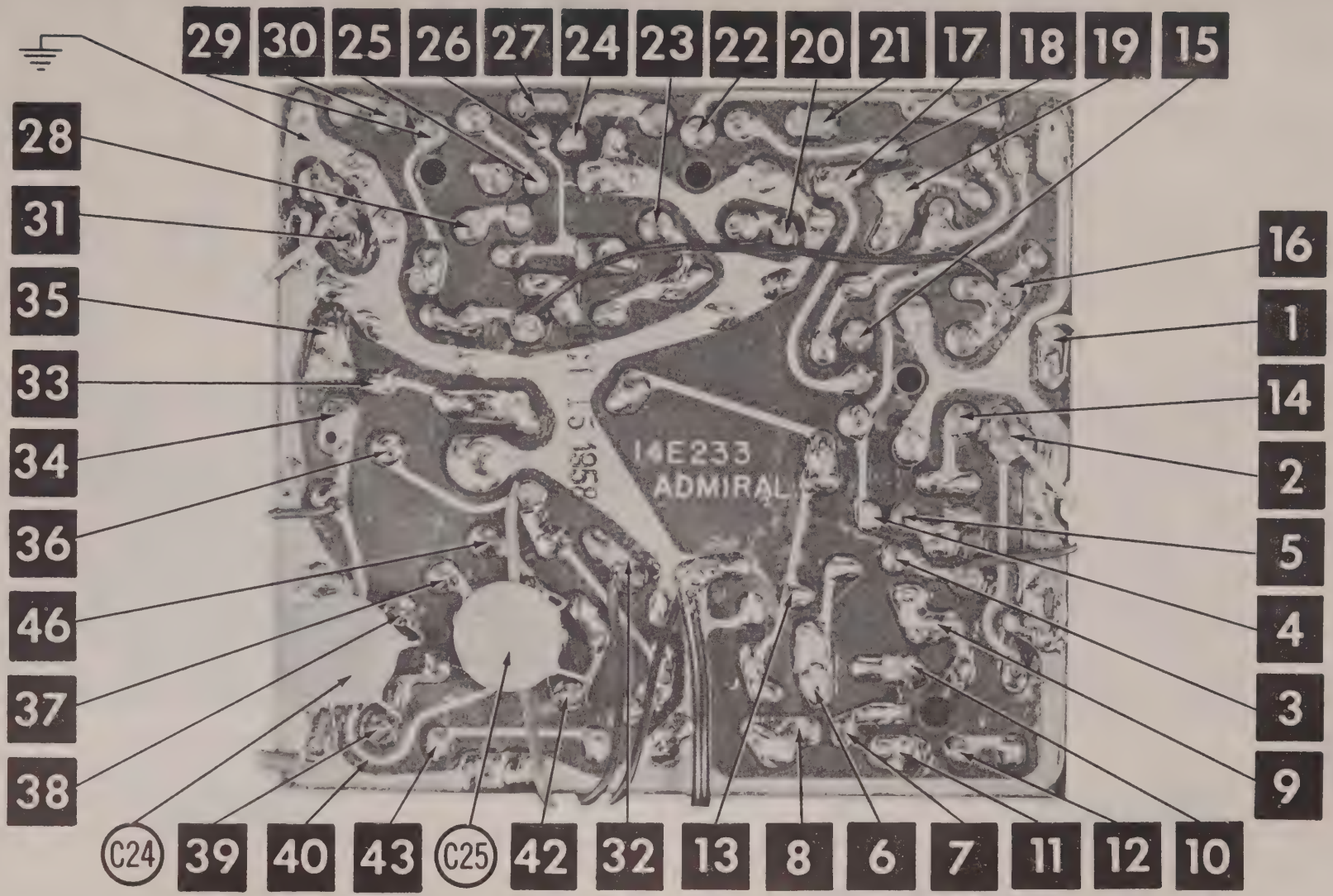
ADMIRAL MODELS 561, 566, 811, 816 (Ch. 851, 851A)



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PRINTED BOARD

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N411	Mixer		2N411		2N411	PNP
X2	2N411	Oscillator		2N411		2N411	PNP
X3	2N409	1st IF Amp.		2N409		2N409	PNP
X4	2N409	2nd IF Amp.		2N409		2N409	PNP
X5	2N406	AVC		2N406	2N363	2N406	PNP
X6	2N408	Driver		2N408		2N408	PNP
X7	2N270	Output		2N270	2N361	2N270	PNP Matched Pair
X8	2N270	Output		2N270	2N361	2N270	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	100	12	67B32-6	BCD12100	ECPB417	PET1500		TE-1162	
C2	100	12	67B32-6	BCD12100	ECPB417	PET1500		TE-1162	
C3	25	3	67B32-13	BCD3025	ECPB11	PET1960		VL-1041	
C4	10	3	67B35-6	PWE3010	NL10-3	TT3X10	ML-10-6	TE-1053	
C5	90	3	67B32-10	BCD10100	ECPB417	PTE1400		TE-1102	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	10000			65D10-41	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C7	50000			65B45-6	BPD-05	DDA-503	H-05S5	TA-150	5HK-S5	
C8	50000			65B45-6	BPD-05	DDA-503	H-05S5	TA-150	5HK-S5	
C9	50000			65B45-6	BPD-05	DDA-503	H-05S5	TA-150	5HK-S5	
C10	470			65D10-70	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C11	10000			65D10-41	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C12	50000			65B45-6	BPD-05	DDA-503	H-05S5	TA-150	5HK-S5	
C13	3.6		NPO±.25mmf	65D6-190					5TCCB-V36S ±.25mmf*	
C14	50000			65B45-6	BPD-05	DDA-503	H-05S5	TA-150	5HK-S5	
C15	50000			65B45-6	BPD-05	DDA-503	H-05S5	TA-150	5HK-S5	
C16	3.6		NPO±.25mmf	65D6-190					5TCCB-V36S ±.25mmf*	
C17	50000			65B45-6	BPD-05	DDA-503	H-05S5	TA-150	5HK-S5	
C18	50000			65B45-6	BPD-05	DDA-503	H-05S5	TA-150	5HK-S5	
C19	50000			65B45-6	BPD-05	DDA-503	H-05S5	TA-150	5HK-S5	

CAPACITORS (cont)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C20	50000			65B45-6	BPD-05	DDA-503	H-05S5	TA-150	5HK-S5	
C21	50000			65B45-6	BPD-05	DDA-503	H-05S5	TA-150	5HK-S5	
C22	3900			65B45-14	BPD-004	DD-392	L10D39	JL-239	5GA-D39	
C23	50000			65B45-6	BPD-05	DDA-503	H-05S5	TA-150	5HK-S5	
C24	3900			65B45-14	BPD-004	DD-392	L10D39	JL-239	5GA-D39	
C25	3900			65B45-14	BPD-004	DD-392	L10D39	JL-239	5GA-D39	
C26	50000			65B45-6	BPD-05	DDA-503	H-05S5	TA-150	5HK-S5	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2500Ω	½	75D1-124		A47-2500-S	Q13-111	U8	Volume
B	Shaft				RS-3/16	NQ	DS-37	
C	Switch				SWE-12	76-1	US-26	Power On-Off
R2A	50K	½	75D1-121	AB-32	A47-50K-Z	Q13-123	U33	Tone, Note 1
B	Shaft			AK-8	RS-3/16	NQ	DS-37	

Note 1. Some versions may use 50K Tone (Part #75D1-123).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ADMIRAL PART No.	NOTES
	OHMS	WATT		
R3	1000Ω		60B8-102	
R4	680Ω 5%		60B8-681	
R5	15K 5%		60B7-153	
R6	15K 5%		60B7-153	
R7	1000Ω		60B8-102	
R8	560Ω		60B8-561	
R9	100K 5%		60B7-104	
R10	430Ω 5%		60B7-431	
R11	5600Ω		60B8-562	
R12	5600Ω		60B8-562	
R13	2700Ω		60B8-272	
R14	1000Ω		60B8-102	
R15	220Ω		60B8-221	

ITEM No.	RATING		ADMIRAL PART No.	NOTES
	OHMS	WATT		
R16	2200Ω		60B8-222	
R17	16K 5%		60B7-163	
R18	3900Ω		60B8-392	
R19	30K 5%		60B7-303	
R20	5600Ω		60B8-562	
R21	560Ω		60B8-561	
R22	270Ω		60B8-271	
R23	10Ω		60B8-100	
R24	10Ω		60B8-100	
R25	100Ω		60B8-101	
R26	6800Ω		60B8-682	
R27	100Ω		60B8-101	
R28	4300Ω 5%		60B7-432	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ADMIRAL PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	69B225-4						
L2	Osc. Coil	69B222-2						
L3	1st IF Trans.	72C189-1						
L4	2nd IF Trans.	72C190-1						
L5	3rd IF Trans.	72C190-2						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1	1	79B76-3						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	55Ω CT	3-4Ω	Part of SP1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	78B156-1 ①	4A1	① Includes T2. Alternate Part #78C156.

BATTERIES

ITEM No.	VOLTAGE	ADMIRAL PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V 1.5V			1 ① 1 ②		935 ① 935 ②		M-14① M-14②	6 used (Receiver) 1 used (Clock)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ADMIRAL PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N87C		1N60 ①	1N295 ①	① Pigtail Type

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	Tuning Cap.	68B66-10	2 Gang (Ant. 272.3mmf, Osc. 102.1mmf Max.)

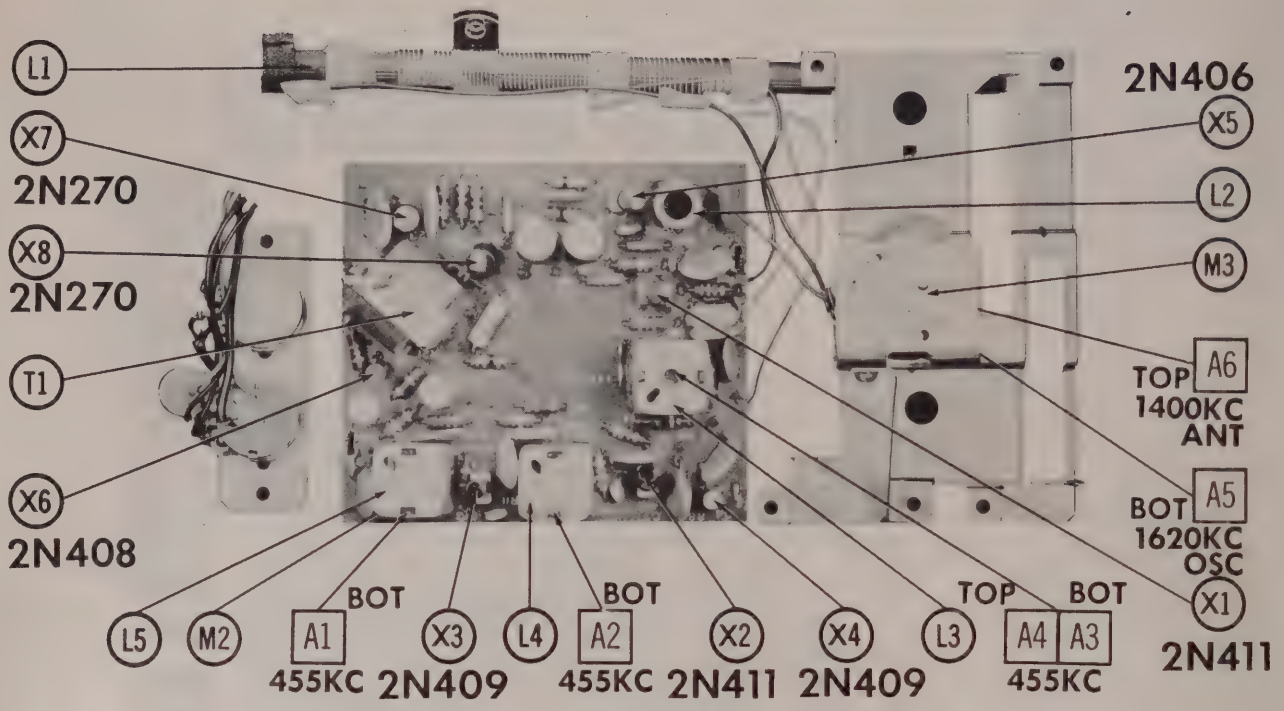
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

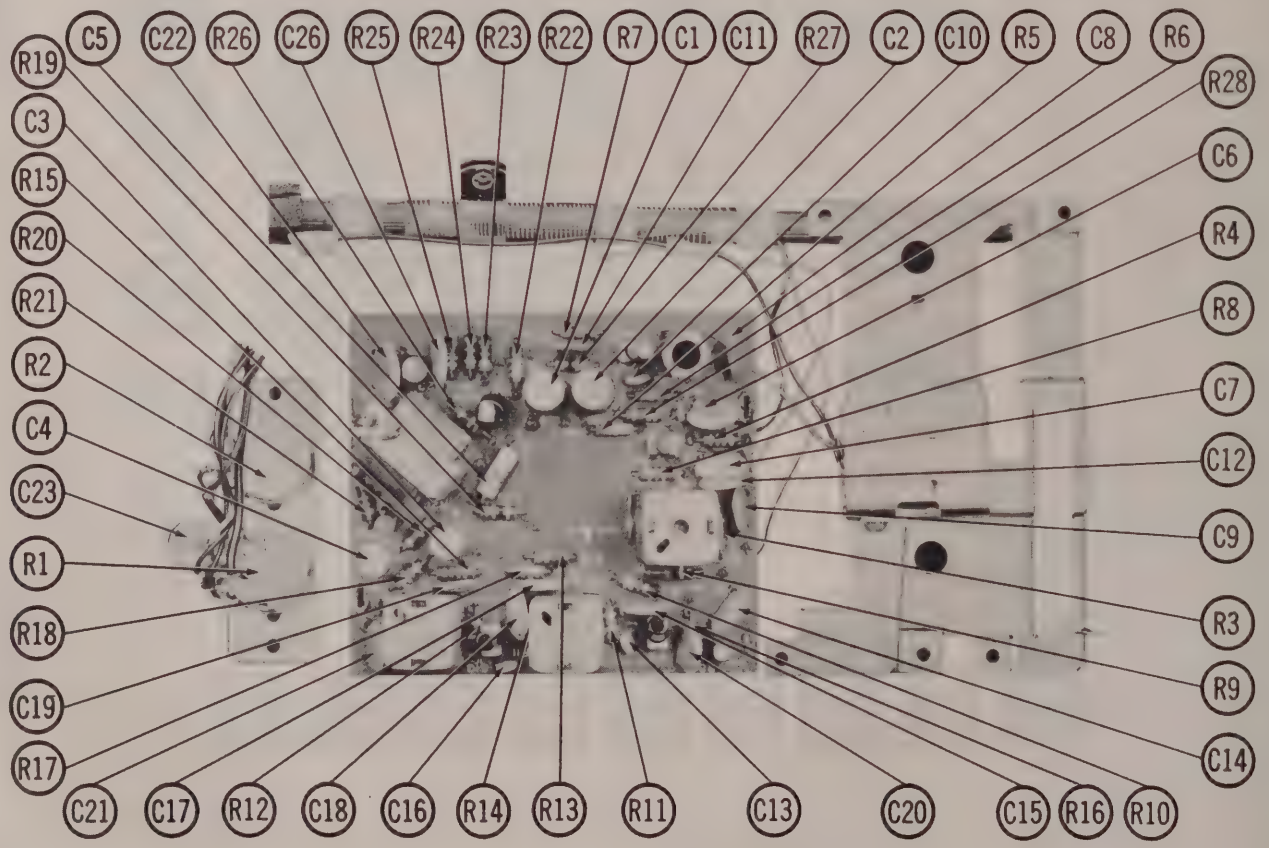
NAME	PART NO.	DESCRIPTION
Knob	33D296-1	Tuning, Models 561, 566
Knob	33D296-2	Tuning, Models 811, 816
Knob	33C230-7	Volume, Tone
Knob	33D292-2	Vernier, Models 561, 566
Knob	91C23-10	Clock, Models 811, 816
Cabinet	34E138-1	Black, Model 561
Cabinet	34E138-2	Gold, Model 566
Cabinet	34E138-3	Black, Model 811
Cabinet	34E138-4	Gold, Model 816
Cabinet Front	34D137-1	Models 561, 566
Cabinet Front	34D136-1	Models 811, 816
Battery Case	A7256	Model 561
Battery Case	A7257	Model 566
Battery Case	A7264	Model 811
Battery Case	A7263	Model 816

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors



CHASSIS TOP VIEW



CHASSIS TOP VIEW

PHOTOFACT* Folder

AIRLINE MODELS GEN-2645A, B, C, GEN-2646A, B, C, GEN-2653A

AIRLINE MODELS GEN-2645A, B, C, GEN-2646A, B, C, GEN-2653A

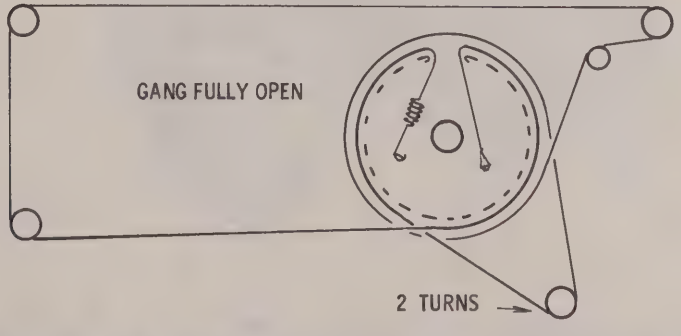
MODEL GEN-2645A

AIRLINE MODELS GEN-2645A, B, C, GEN-2646A, B, C, GEN-2653A

TRADE NAME	Airline Models GEN-2645A, B, C; GEN-2646A, B, C; GEN-2653A		
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Illinois		
TYPE SET	AC Operated 16 Tube FM-AM Receiver with 4 Speed Automatic Record Changer		
POWER SUPPLY	105-125 Volts AC, 60 Cycles	RATING	138 Watts, 1.27 Amp. @ 117 Volts AC (FM)
TUNING RANGE	BROADCAST 540 - 1640KC	FREQ. MOD.	88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #E808 - SEE V-M 1200A - PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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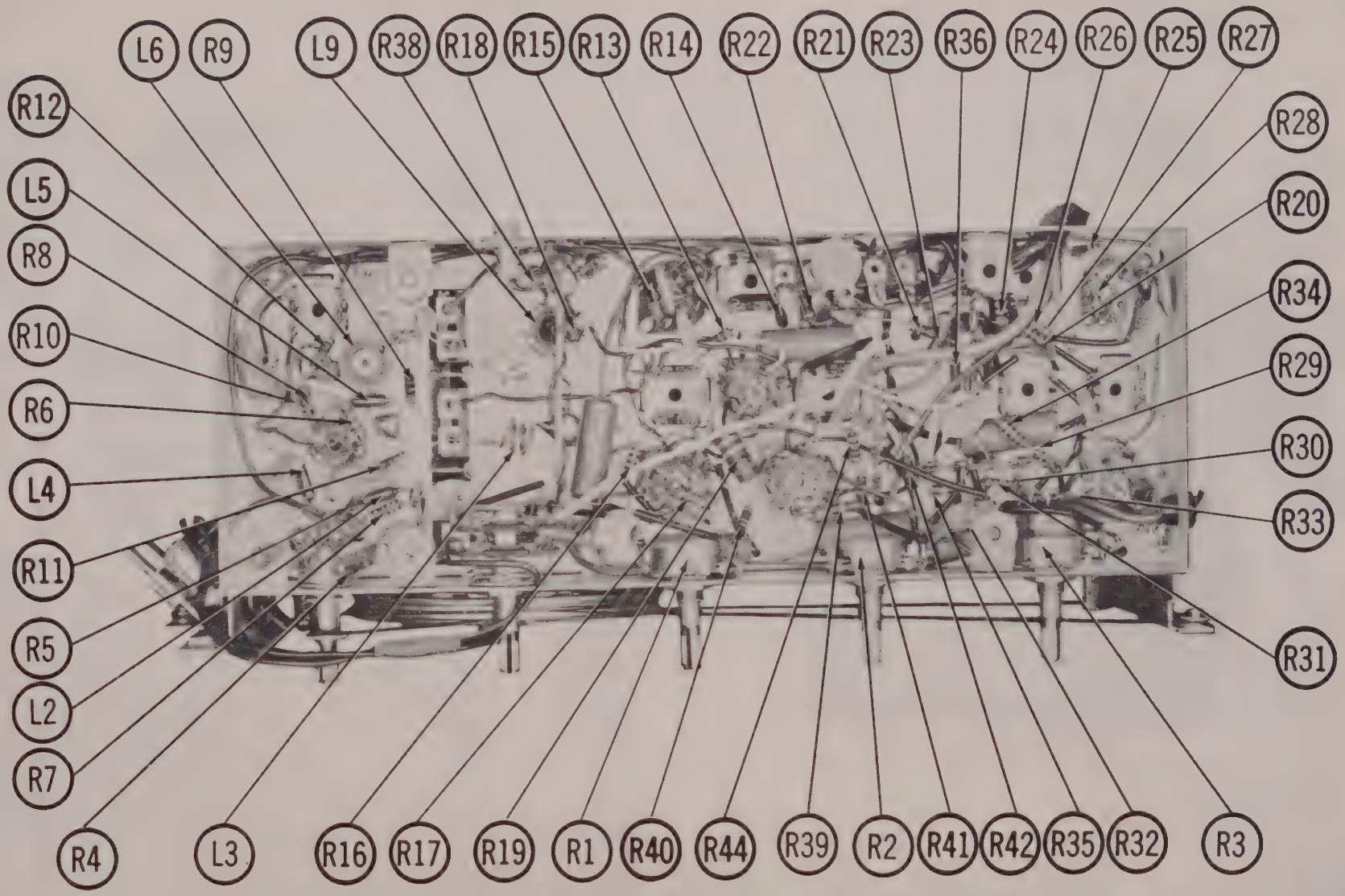
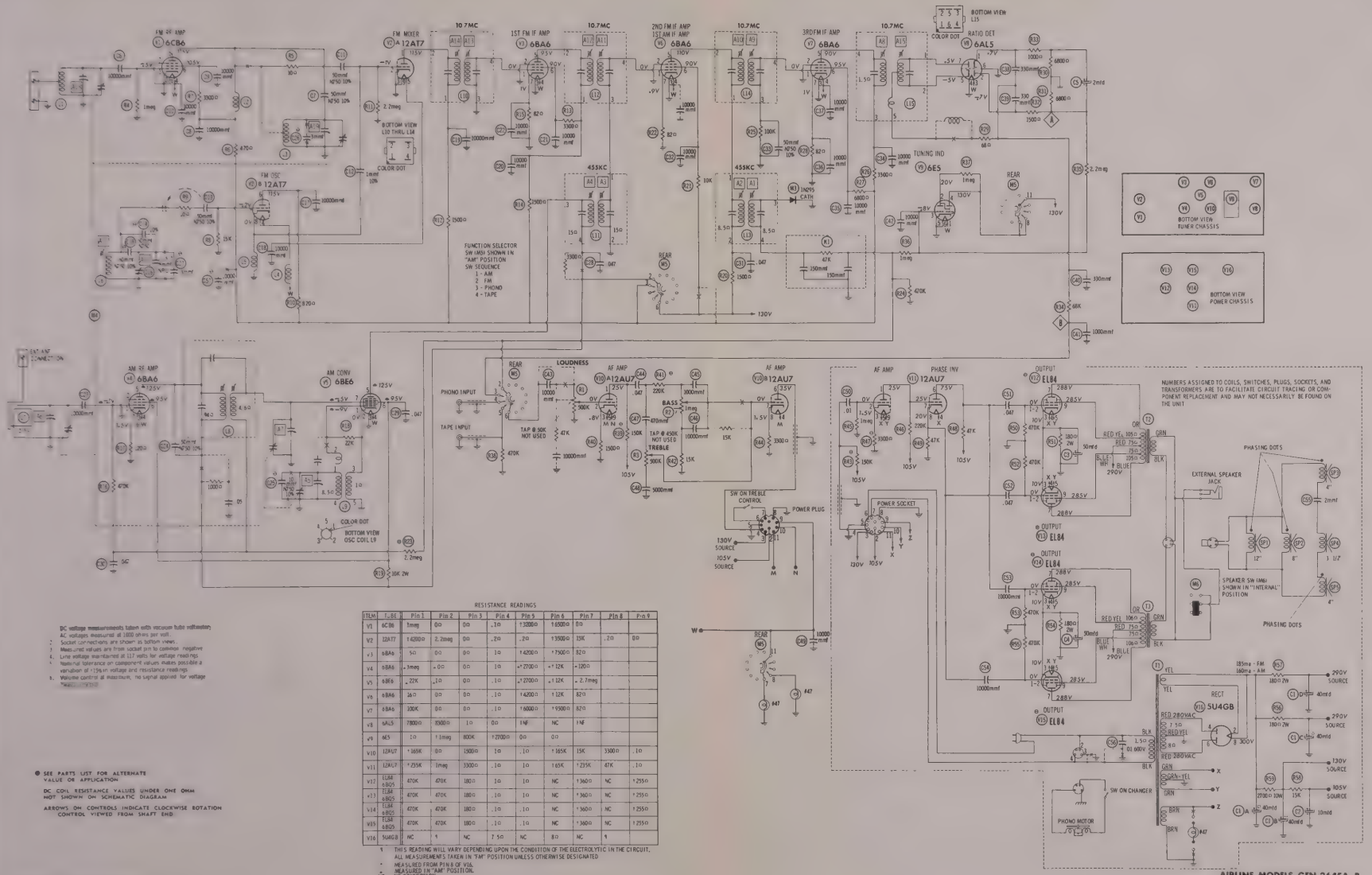


CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT

DC voltage measurements taken with vacuum tube voltmeter.
AC voltages measured at 1000 ohms per volt.
Socket connections are shown as bottom views.
Measured values are from socket pin to common negative.
Line voltage maintained at 117 volts for voltage readings.
Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
Volume control at maximum, no signal applied for voltage readings.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	1meg	0Ω	0Ω	.1Ω	†320ΩΩ	†650ΩΩ	0Ω		
V2	12AT7	†420ΩΩ	2.2meg	0Ω	.2Ω	.2Ω	†3500Ω	15K	.2Ω	0Ω
V3	6BA6	5Ω	0Ω	0Ω	1Ω	†420ΩΩ	†750ΩΩ	82Ω		
V4	6BA6	1meg	0Ω	0Ω	1Ω	*†2700Ω	*†12K	†100Ω		
V5	6BE6	22K	1Ω	0Ω	.1Ω	*†2700Ω	*†12K	2.7meg		
V6	6BA6	1Ω	0Ω	0Ω	.1Ω	†420ΩΩ	†12K	82Ω		
V7	6BA6	100K	0Ω	0Ω	.1Ω	†6000Ω	†9500Ω	82Ω		
V8	6AL5	7800Ω	8500Ω	1Ω	0Ω	INF	NC	INF		
V9	6E5	1Ω	†1meg	800K	†2700Ω	0Ω	0Ω			
V10	12AU7	†165K	0Ω	1500Ω	1Ω	.1Ω	†165K	15K	3300Ω	.1Ω
V11	12AU7	†255K	1meg	3300Ω	.1Ω	1Ω	†65K	†255K	47K	.1Ω
V12	EL84 6BQ5	470K	470K	180Ω	1Ω	1Ω	NC	†360Ω	NC	†255Ω
V13	EL84 6BQ5	470K	470K	180Ω	1Ω	1Ω	NC	†360Ω	NC	†255Ω
V14	EL84 6BQ5	470K	470K	180Ω	.1Ω	.1Ω	NC	†360Ω	NC	†255Ω
V15	EL84 6BQ5	470K	470K	180Ω	.1Ω	.1Ω	NC	†360Ω	NC	†255Ω
V16	5U4GB	NC	†	NC	7.5Ω	NC	8Ω	NC	†	

† THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT. ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
* MEASURED FROM PIN 8 OF V16.
** MEASURED IN "AM" POSITION.
NC NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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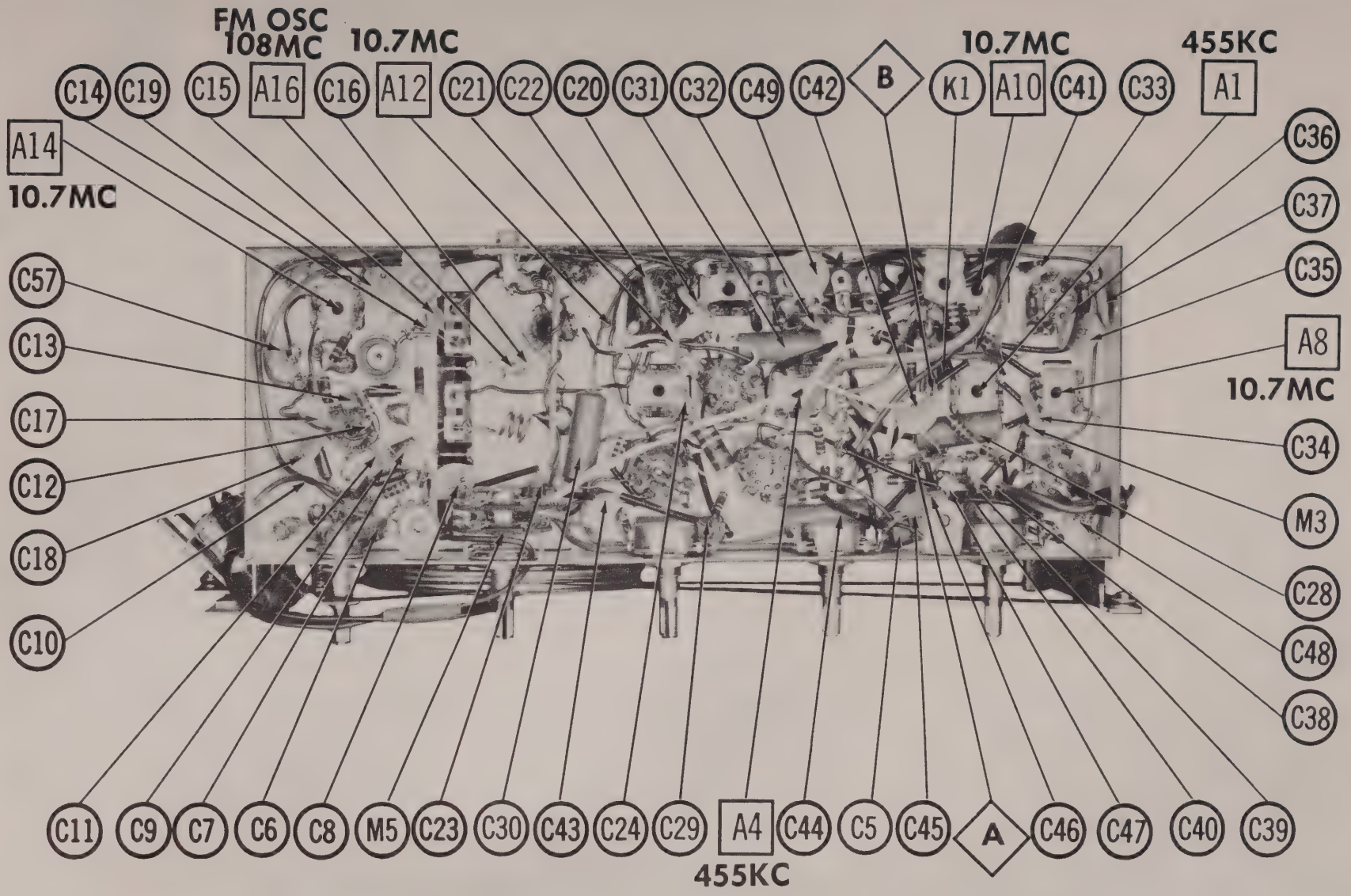
AIRLINE MODELS GEN-2645A, B, C, GEN-2646A, B, C, GEN-2653A



CHASSIS BOTTOM VIEW - CAPACITOR, MISC. & ALIGN. IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools:

A1, A2, A3, A4, A8 thru A15 ..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6, A7, A16, A18, A19 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A17 ..... GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9298, 5003
WALSCO #2516, 2519

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of AM Converter (V5). Low side to chassis.	455KC (400~ Mod.)	AM	Tuning gang fully open	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1640KC	"	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	"	1400KC	"	A6, A7	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.005mfd	High side to pin 2 (grid) of FM Mixer (V2A). Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully open	DC probe to point Ⓐ. Common to chassis.	A8, A9, A10, A11, A12, A13, A14	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point Ⓑ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.005mfd	High side to pin 2 (grid) of FM Mixer (V2A). Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully open	Vert. Amp. to point Ⓐ. Low side to chassis.	A8, A9, A10, A11, A12, A13, A14	Disconnect stabilizing capacitor C5. Adjust for maximum gain and symmetry of response similar to Fig. 1. Reconnect C5.
5.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Two 120Ω Carbon Resistors	Across FM antenna terminals with 120Ω in each lead	108MC (Unmod.)	FM	Tuning gang fully open	DC probe to point Ⓐ. Common to chassis.	A16	Adjust for maximum deflection.
7.	"	"	88MC	"	Tuning gang fully closed	"	A17	Adjust for maximum deflection. Repeat step 6.
8.	"	"	105MC	"	105MC	"	A18, A19	Adjust for maximum deflection while rocking tuning gang.

FIG. 1

FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6CB6	
V2	FM Mixer - FM Osc.	12AT7	
V3	1st FM IF Amplifier	6BA6	
V4	AM RF Amplifier	6BA6	
V5	AM Converter	6BE6	
V6	2nd FM - 1st AM IF Amp.	6BA6	
V7	3rd FM IF Amplifier	6BA6	
V8	Ratio Detector	6AL5	

ITEM No.	USE	TYPE	NOTES
V9	Tuning Indicator	6E5	
V10	AF Amplifier	12AU7	
V11	AF Amp. - Phase Inv.	12AU7	
V12	Output	EL84/6BQ5	
V13	Output	EL84/6BQ5	
V14	Output	EL84/6BQ5	
V15	Output	EL84/6BQ5	
V16	Rectifier	5U4GB	

ELECTROLYTIC CAPACITORS

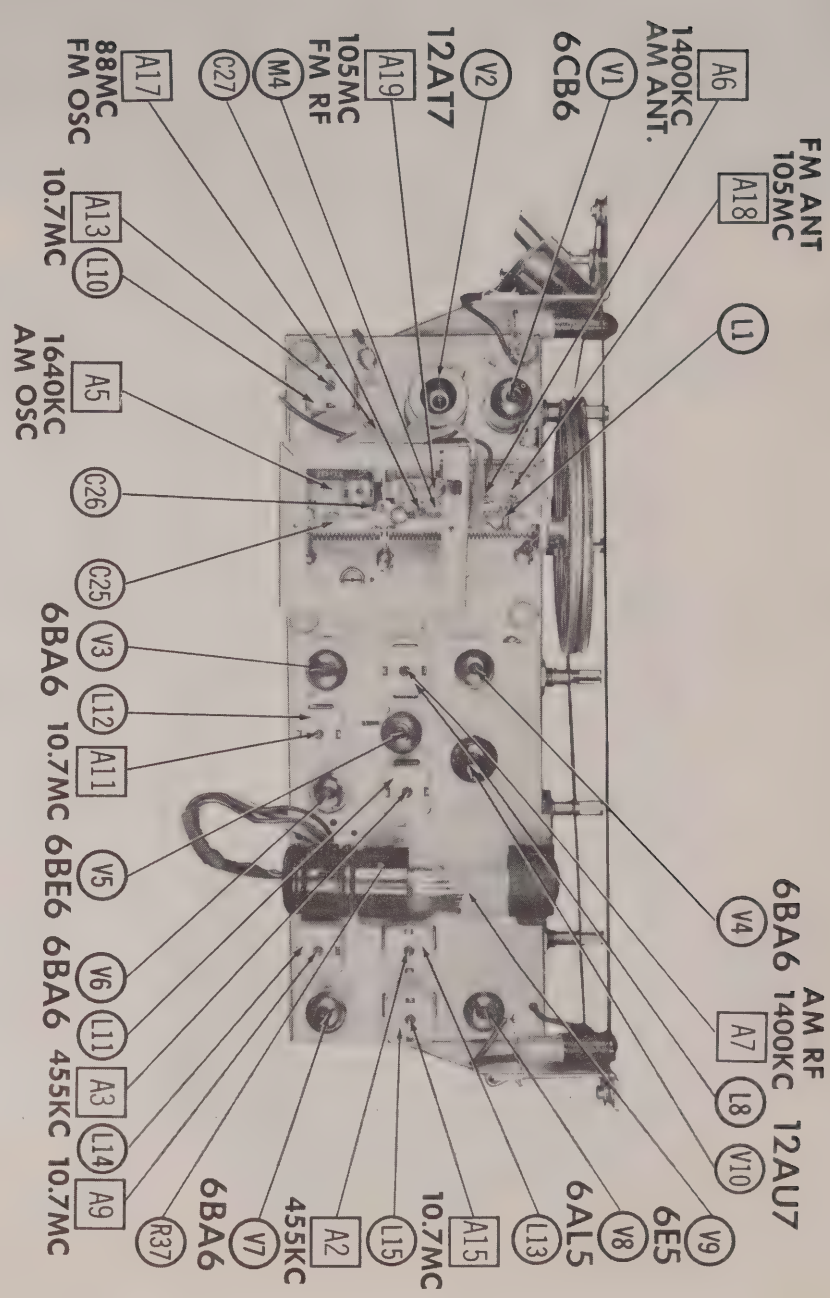
ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■40	350	E3222	AFH4-04-50	D0034	FP420.38	TMQ-120	TVL-4635.3	
B	▲40	350							
C	▲40	350							
D	40	350							
C2	10	350	E3219	PRS350V10	BR1045	TC62	TD-10-450	TVA-1604	
C3	50	25	E3221	PRS25V50	BBR50-25	TC29	TD-50-25	TVA-1206	
C4	50	25	E3221	PRS25V50	BBR50-25	TC29	TD-50-25	TVA-1206	
C5	2	50	E3223	PRS50V2	BBR2-50	TC302	TD-2-50	TVA-1301	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C7	50		N750 10%			TCN-50	C10Q5U		5TCU-Q50S 10%*	
C8	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C9	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C10	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	50		N750 10%			TCN-50	C10Q5U		5TCU-Q50S 10%*	
C12	1		10%		NPO-SI 1	TCZ-1		CNO-510	5TCCB-V1S 10%*	
C13	50		N750 10%			TCN-50	C10Q5U		5TCU-Q50S 10%*	
C14	50		N750 10%			TCN-50	C10Q5U		5TCU-Q50S 10%*	①
C15	50		N750 10%			TCN-50	C10Q5U		5TCU-Q50S 10%*	①
C16	1.5-7		NPO			822-EZ		ST-5515-Z		
C17	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C18	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C19	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C20	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C21	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C22	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C23	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C24	50		N750 10%			TCN-50	C10Q5U		5TCU-Q50S 10%*	
C25	10		N750 10%		N750-DI 10	TCN-10	C10Q1U		5TCU-Q10S 10%*	②③
C26	3				NPO-SI 3	D6-030	C10V3C	ZT-553	5TCCB-V3S	②③
C27	3				NPO-SI 3	D6-030	C10V3C	ZT-553	5TCCB-V3S	②③
C28	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C29	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C30	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C31	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C32	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C33	50		N750 10%			TCN-50	C10Q5U		5TCU-Q50S 10%*	
C34	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C35	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C36	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C37	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C38	330			E3336	BPD-00033	DD-331	L10T33	B-333	5GA-T33	
C39	330			E3336	BPD-00033	DD-331	L10T33	B-333	5GA-T33	
C40	330			E3336	BPD-00033	DD-331	L10T33	B-333	5GA-T33	
C41	1000			E3337	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C42	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C43	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C44	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C45	1000			E3337	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C46	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C47	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C48	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C49	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C50	.01	400			P488N-01	DD-103	CUB4S1	GEM-411	4TM-S1	
C51	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C52	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C53	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C54	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C55	2.0			E3026						
C56	.01	600			P1684CM-01	DD16-103	CUB16S1	GEM-1611	MB-S1	
C57	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	②

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① When C14 is 100mmf, C15 is not used. ② Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	E2525	BT-62	A47F4-500K	Q16-133X	UT-429	Loudness, Tap ④ 50K (Not used)
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	1meg	½	E2526	BT-74	A47F5-1meg	Q19-137X	UT-443	Bass, Tap③450K (Not used)
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K	½	E2527	B-59	A47-500K-S	Q11-133	U50	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power On-Off

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		AIRLINE PART No.	NOTES
	OHMS	WATT		
R4	1meg			
R5	10Ω			
R6	470Ω			
R7	3300Ω			
R8	15K			
R9	10Ω			
R10	820Ω			
R11	2.2meg			
R12	1500Ω			
R13	3300Ω			
R14	1500Ω			
R15	82Ω			
R16	470K			
R17	120Ω			
R18	22K			
R19	10K	2		
R20	1500Ω			
R21	10K			
R22	82Ω			
R23	2.2meg			Note 1
R24	470K			
R25	100K			
R26	3300Ω			
R27	6800Ω			
R28	82Ω			
R29	68Ω			
R30	6800Ω			
R31	6800Ω			
R32	1500Ω			
R33	1000Ω			
R34	68K			
R35	2.2meg			
R36	1meg			
R37	1meg			
R38	470K			

Note 1. Some versions may use 1meg in this application.
Note 2. Some versions may use 47K in this application.

RESISTORS (cont)

ITEM No.	RATING		AIRLINE PART No.	NOTES
	OHMS	WATT		
R39	150K			Note 2
R40	1500Ω			
R41	220K			Note 3
R42	15K			
R43	150K			Note 2
R44	3300Ω			
R45	1meg			
R46	220K			
R47	3300Ω			Note 4
R48	47K			
R49	47K			
R50	470K			
R51	180Ω	2		
R52	470K			
R53	470K			
R54	180Ω	2		
R55	470K			
R56	180Ω	2		
R57	180Ω	2		
R58	15K			
R59	2700Ω	10	E235	

Note 3. Some versions may use 68K in this application.
Note 4. Some versions may use 6800Ω in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		AIRLINE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil	E6131						3uh
L2	RF Choke	E6134						
L3	FM RF Coil	E6132						3uh
L4	Fil. Choke	E6134						3uh
L5	Cathode Choke	E6134						
L6	FM Osc. Coil	E6133						
L7	Loop Ant.	E6026						
L8	AM RF Trans.	E6219						
L9	AM Osc. Coil	E6135						
L10	1st FM IF Trans.	E627189	16-3487	16-3487	FM-254	1463		
L11	1st AM IF Trans.	E6256	16-6758	16-6758	BC-352	12-C1	RF-1	
L12	2nd FM IF Trans.	E6217	16-3487	16-3487	FM-254	1463		
L13	2nd AM IF Trans.	E6218	16-6758	16-6758	BC-353	12-C2	RF-2	
L14	3rd FM IF Trans	E6217	16-3487	16-3487	FM-254	1463		
L15	Ratio Detector	E6283	17-3498	17-3498	FM-255	1465		

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ 1.27A	560 VCT ⓐ .185A	5V ⓐ 3A	E1120						
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT ⓐ 2.4A	6.3V ⓐ 2.5A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2 & T3	5500Ω CT Screen Taps ⓐ 1400Ω CT	6-8Ω	E-1119							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	
SP1	12"	PM	18-19Ω	E1027		① Models GEN-2645A, B, C; GEN-2646A, B, C. ② Models GEN-2653A
SP2	8"	PM	15-16Ω	E1032①		
SP3	4"	PM	3-4Ω	E1025①	4A07	
SP4	3½"	PM	6-7Ω	E1026①	3A15TZ6.2	
SP5	4"	PM	3-4Ω	E1025①	4A07	
	10"	PM		E1028②		
	5"	PM		E1029②		

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE PART No.	REPLACEMENT DATA
K1	AM Det. RF Filter	150mmf, 150mmf, 47K	E3220	Aerovox PA-98 Centralab PC-51 Cornell-Dubilier 111TM2 Sprague D-2

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	AIRLINE PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	60-51	93-TX				

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	AIRLINE PART No.	JENSEN PART No.	WALCO PART No.	
M2			*W201DS ♦†	* Includes Cartridge † Jewel ♦ Diamond

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		AIRLINE PART No.	CBS PART No.	SYLVANIA PART No.	
M3	1N295		1N60	1N295	AM Det. (Pigtail)

MISCELLANEOUS

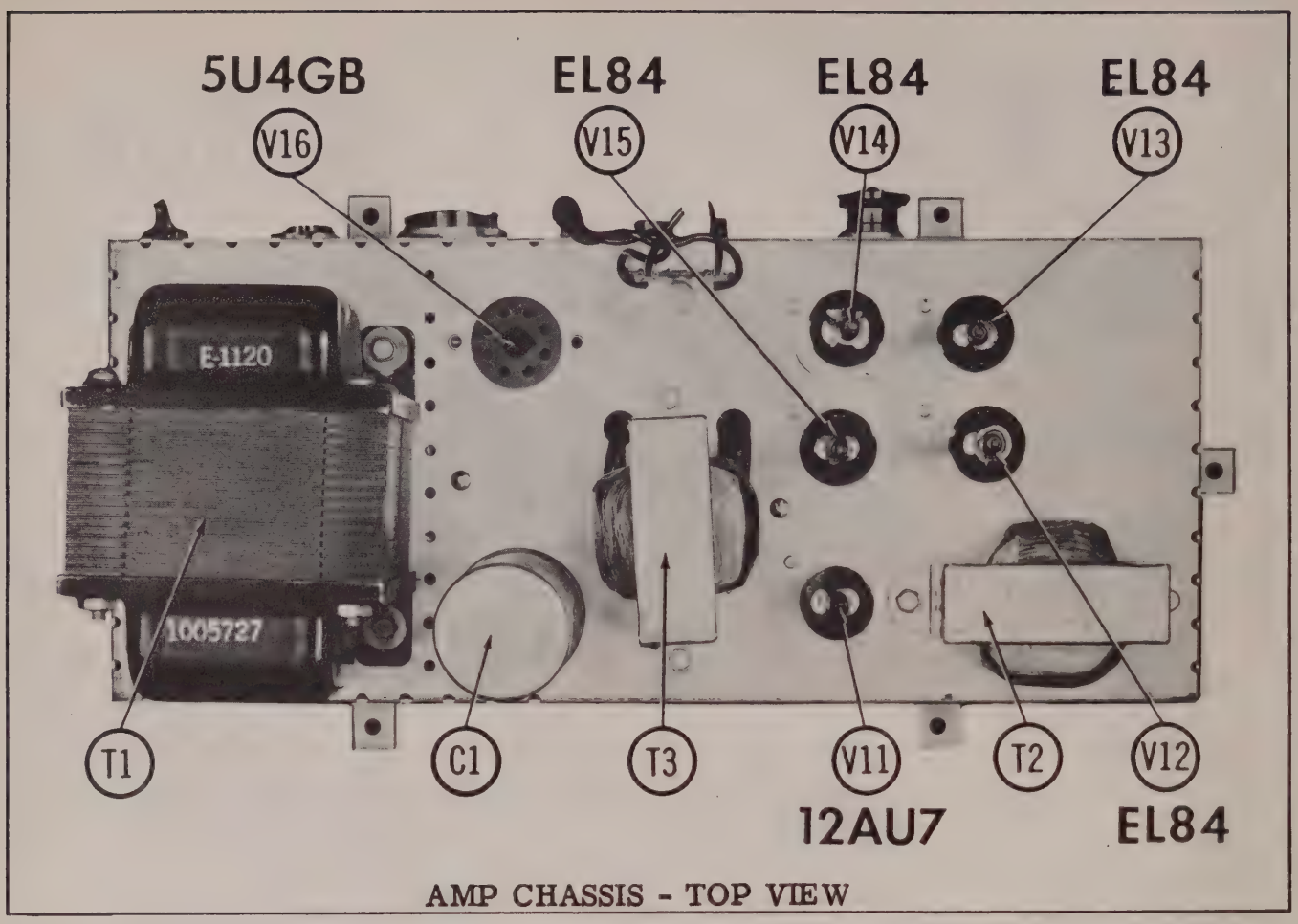
ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M4	Tuning Cap	E3522A	FM-AM, 5 Gang
M5	Switch	E1211	Function (Rotary Wafer Type)
M6	Switch	E1210	External Speaker(DPDT, Slide Type)

CABINETS & CABINET PARTS

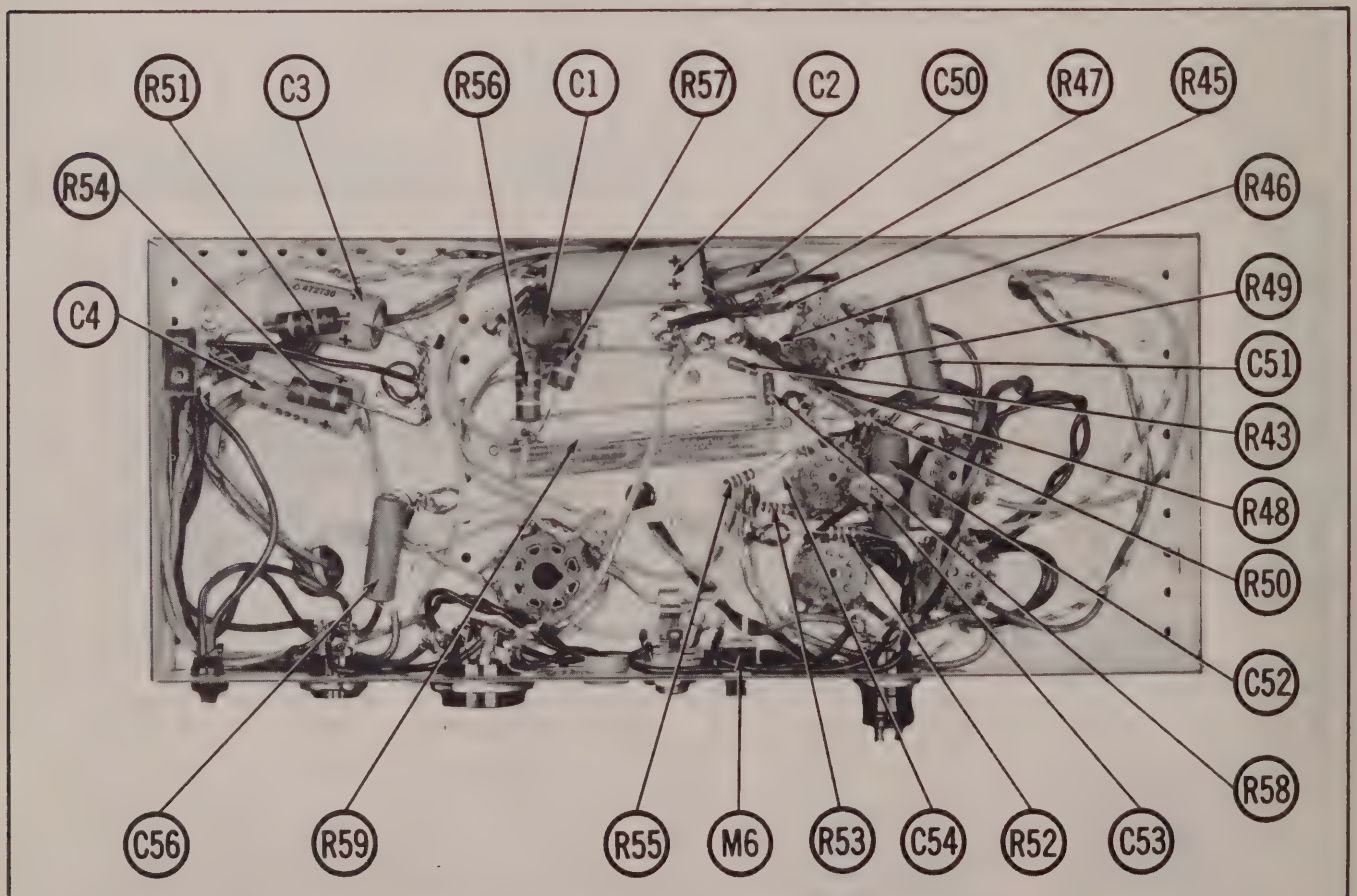
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



AMP CHASSIS - TOP VIEW

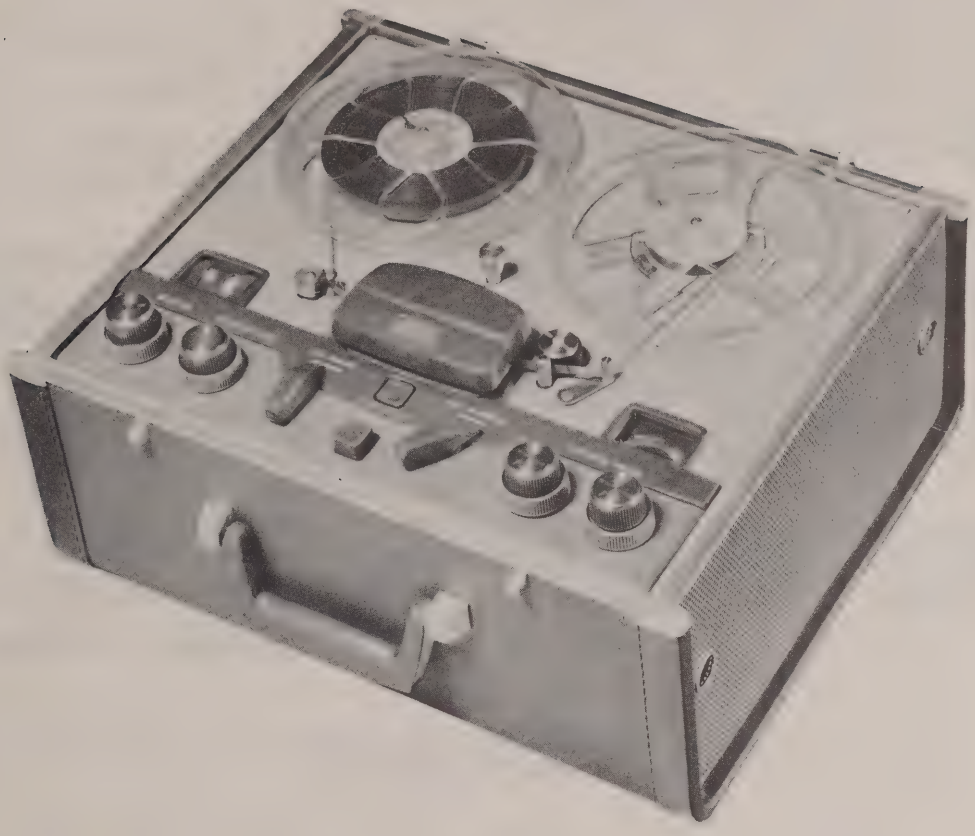


AMP CHASSIS - BOTTOM VIEW

PHOTOFACT* Folder

*TRADE MARK

AMPEX MODELS
952, 954, 960



GENERAL INFORMATION

Ampex Models 952, 954, and 960 tape recorders are universal stereophonic recorders and reproducers. The major differences among the models are in the color and in the mounting. Models 952 and 954 have no portable case; Model 960 has a portable case. Models 952 and 960 are grey; Model 954 is beige.

Ampex tape recorders have a feature for changing the heads for two-track and four-track tapes, and an automatic stop that stops the tape at the end of a reel. These recorders can be played at two tape speeds, 7 1/2 ips or 3 3/4 ips.

Two microphone jacks for recording stereo tapes are provided at the right side of the recorder.

Manufactured by:
Ampex Corporation
934 Charter Street
Redwood City, California

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS 6, INDIANA

C393

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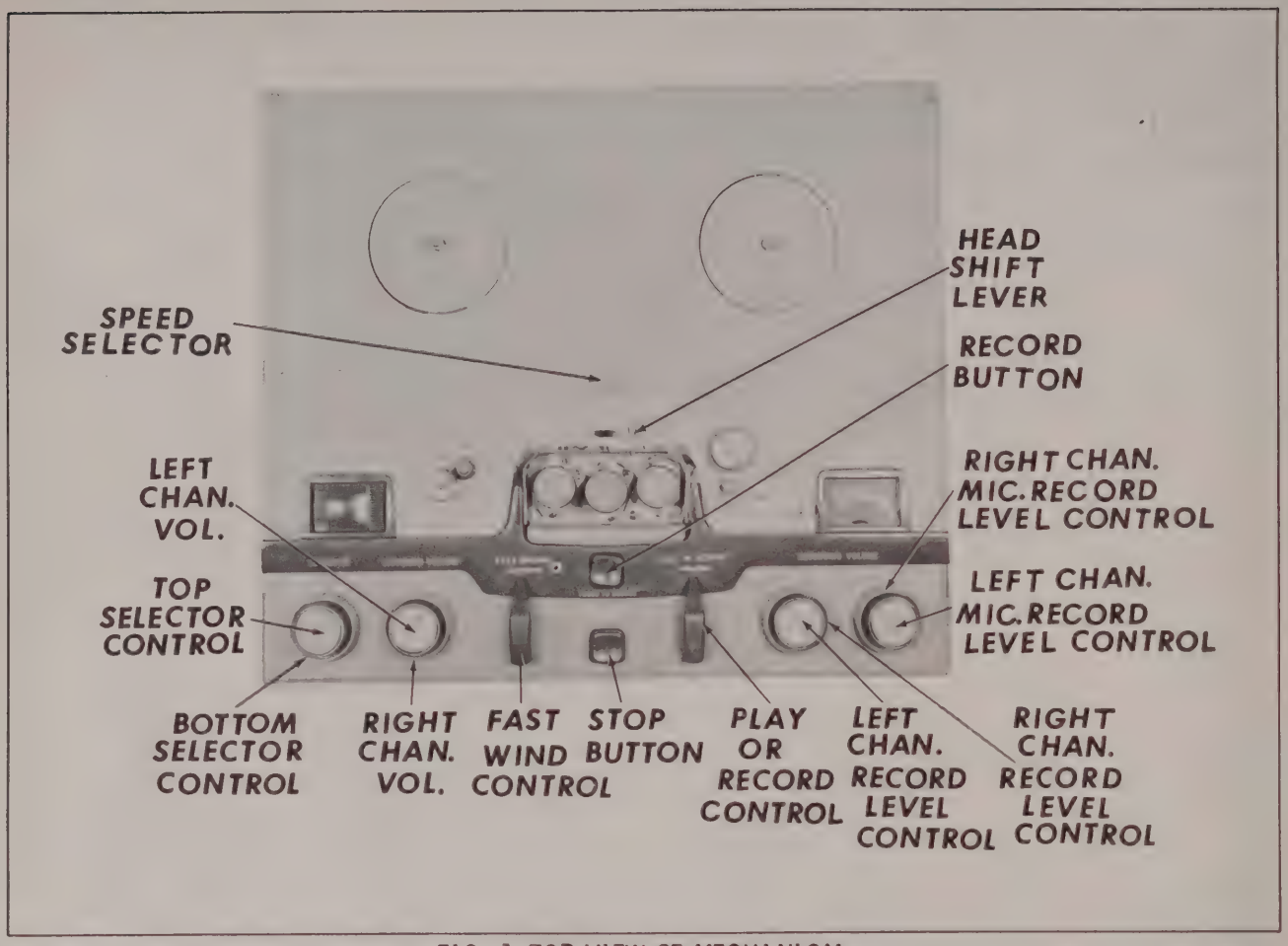


FIG. 1 TOP VIEW OF MECHANISM

SPECIFICATIONS

Heads:

Separate stacked heads for record, playback, and erase. Special two-channel playback head has built-in shift control for accommodating either four-track or two-track tapes.

Rewind Time:

Less than 90 seconds for 1,200-foot reel.

Record Inputs:

High-impedance line input (radio-TV-phono auxiliary), 0.3 volt rms for program level; high-impedance microphone inputs.

Playback Output:

Approximately 1/2 volt rms from cathode follower when program level tapes are being played.

CONTROLS, BUTTONS, AND INDICATORS

Top Selector

Top Selector control turns on the power and selects desired monitor or playback functions.

Bottom Selector

Bottom Selector control selects single or stereo record and the recording level meter for the left or right channel.

Left Channel Volume

Left Channel Volume control adjusts volume of left channel when recorded tapes are being played back.

Right Channel Volume

Right Channel Volume control adjusts volume of right channel when recorded tapes are being played back.

Fast Winding

Fast Winding bar knob quickly moves tape forward or backward.

Stop

Stop button stops tape in any mode and releases Record button when it is locked in the Record position.

Record

Record button places tape recorder in the Record position.

Play-Record

Play-Record bar knob locks the unit in the Play (reproduce) or Record mode.

Left Channel Recording Level

Left Channel Recording Level control adjusts left-channel recording level of radio, phonograph, or tuner.

Right Channel Recording Level

Right Channel Recording Level control adjusts right-channel recording level of radio, phonograph, or tuner.

Left Channel Microphone Recording Level

Left Channel Microphone Recording Level control adjusts left-channel microphone recording level.

Right Channel Microphone Recording Level

Right Channel Microphone Recording Level control adjusts right-channel microphone recording level.

Recording Level Meter

Recording level meter indicates the recording level of the left or right channel as selected by the Bottom Selector control.

Tape Counter

Tape counter indicates the position of the tape.

Speed Control

Speed control button selects tape speeds: up for 7 1/2 ips, down for 3 3/4 ips.

NOTE: Recorder must be on when speeds are changed.

Head Shift

Head Shift control selects tape tracks: down for two-track tape, up for four-track tape.

Automatic Stop

Automatic stop arm automatically stops the tape at the end of a reel.

OPERATING INSTRUCTIONS

Tape Threading

1. Place a reel of tape on the left-hand turntable; Place an empty reel on the right-hand turntable. Be sure the protrusion around the base of each turntable engages the corresponding slots on the reel hub.

2. Thread the tape between tape holdback (9) and tape guide (8), across the tape heads, between capstan idler (4) and capstan (38), and across automatic stop arm (12A). See photograph of unit on the first page for an example of proper tape threading.

NOTE: When the tape is threaded on the unit according to the path described in the foregoing, the top half of the tape is the left channel and the bottom half is the right channel. This statement applies to two-channel stereo tape only. Monaurally, the same tape always records or plays on the top half in a left to right direction. Remembering that the top of the tape is to the left will help the operator remember the position of the controls.

To Record Monaurally with a Microphone

1. Place the Top Selector control and the Bottom Selector control in the single position. If the Bottom Selector control is not put in the single position, the full width of the tape and any program on the reverse half of the tape will be erased.

2. Connect a high-impedance microphone to the left input jack (front jack on the side of the unit).

3. Adjust microphone recording level on recording level meter by using the Left Channel Microphone Level control (Top control).

4. Set tape position indicator (61) at 0-0 with fingertip (move in either direction).

5. Simultaneously, depress Record button and turn Play or Record knob until it clicks into position and holds. Changes in level may be made at any time during a recording by using the Left Channel Microphone Level control (Top control).

NOTE: When stopping the tape, always use the Stop button; never attempt to stop the recorder by using the bar knobs (6).

To Play Back Monaural Tapes

1. Place Top Selector control in single position.

2. Thread tape as described under "Threading Tape."

3. Move Play-Record bar knob clockwise until it clicks into position. Do not depress Record button; depressing it will start tape erasure.

4. Turn Left Channel Volume control to desired sound level.

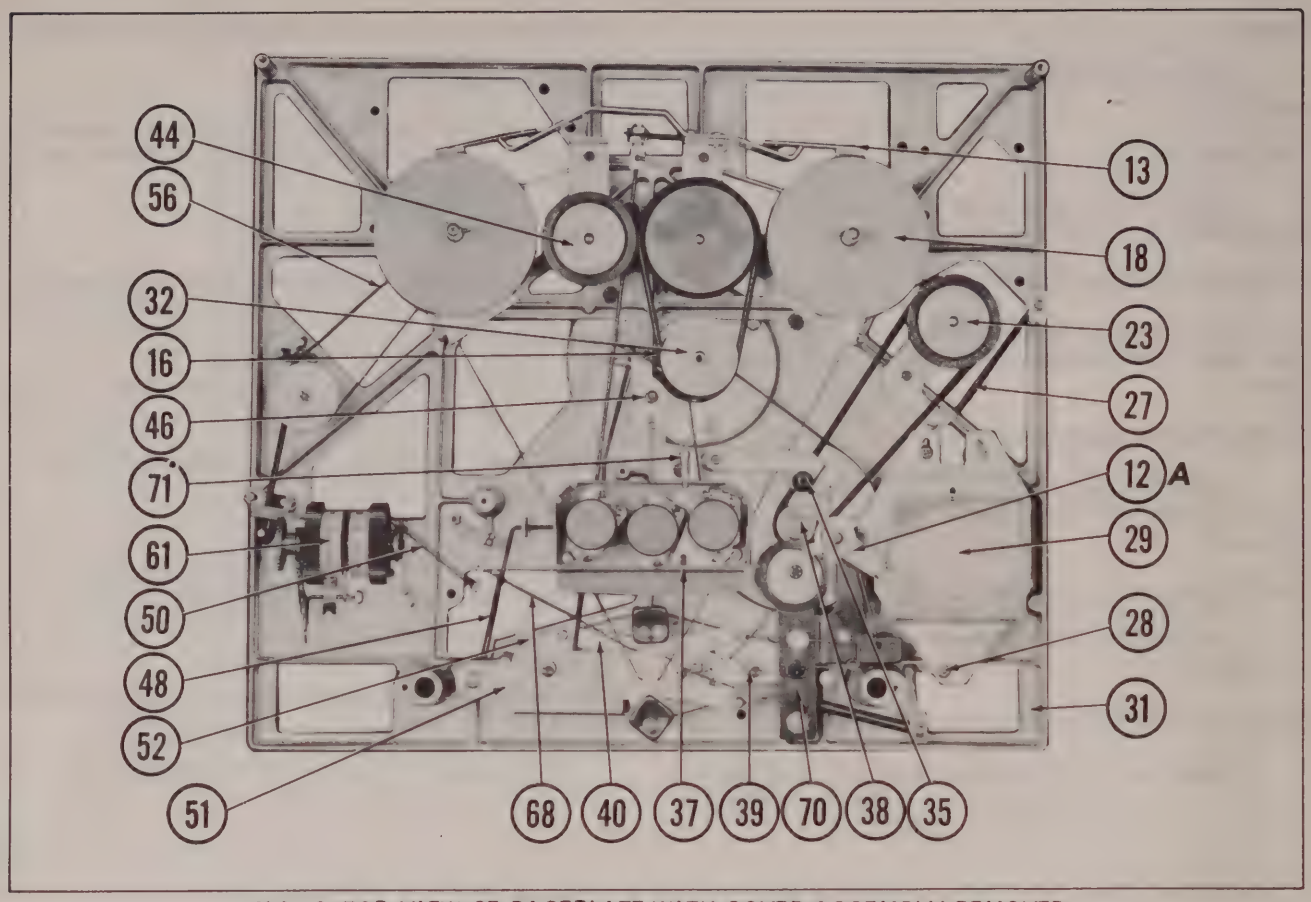


FIG. 2 TOP VIEW OF BASEPLATE WITH COVER ASSEMBLY REMOVED

NOTE: Head shift rod (71) should be down when half-track or two-track stereo tapes are being played back. When four-track stereo tapes are being played back, head shift rod (71) must be up.

To Record Monaurally from Radio, TV, or Phonograph

1. Place Top Selector control and Bottom Selector control in the single position. If the Bottom Selector control is not placed in the single position, the full width of tape or any program on the reverse half of the tape will be erased.

2. Connect cable from source (radio, TV, or phono) to left input at the rear of the recorder.

3. Adjust recording level on the recording level meter by using the Left Channel Recording Level control (Top Control).

NOTE: Left Channel Level control and Left Channel Microphone Recording Level control can be used simultaneously as a mixer control. Thus, live talent can be added with the microphone while a recording is being made from radio, TV, or phonograph.

To Record Two-Channel Stereo with a Microphone

1. Turn Top Selector control to Stereo position.

2. Turn the Bottom Selector control to the Stereo position.

NOTE: The Stereo position on the Bottom Selector control can be either to the right or to the left. In these positions, the recording levels of the two channels are balanced. When the Bottom Selector is in the left position, the recording level meter will indicate the signal strength on the left channel. When the Bottom Selector is in the right position, the recording level meter will indicate the signal strength on the right channel. The Bottom Selector control can be moved between the left and the right positions at any time during a recording without affecting the recording if visual balance checks are desired.

3. Connect one high-impedance microphone to the input jack at the front. This is the left channel.

4. Connect another high-impedance microphone to the input jack at the rear. This is the right channel.

5. Set the tape position indicator to 0—0.

6. Adjust microphone levels as described in the foregoing Note; use the Left Channel Microphone Recording Level control for the left channel, the Right Channel Microphone Recording Level control for the right channel.

7. Simultaneously, depress the Record button and turn the Play-Record bar knob until it clicks into position and holds.

To Record Two-Channel Stereo from Radio, Phonograph, or Another Tape

1. Follow Steps 1 and 2 in "To Record Two-Channel Stereo with a Microphone."

2. Connect cables from source to left and right input jacks at rear of recorder.

3. Adjust recording levels by using recording level meter (29) as a reference and by using procedure outlined in the Note under "To Record Two-Channel Stereo with a Microphone."

4. Simultaneously, depress the Record button and turn the Play-Record control until it clicks into position and holds.

NOTE: The Left Channel Recording Level and Right Channel Recording Level controls, and the Left Channel Microphone Recording Level and the Right Channel Microphone Recording Level controls may be used as mixer controls; thus, live talent may be added with the two microphones to a stereo recording being made from a radio, phonograph, or other tape.

To Record Sound on Sound

First sound-track recording —right channel.

1. Place Top Selector control in Stereo Right (R) position.

2. Connect microphone to right microphone jack (rear jack).

3. Adjust recording level by using the Right Channel Microphone Recording Level control and recording level meter (29) as a reference.

4. Place the unit in the Record mode, and record the first sound track.

5. After the recording is finished, rewind the tape to the start of the first sound track.

Second composite sound track—sound on sound.

1. Set up the Ampex 2012 amplifier/ speaker or its equivalent.

2. Connect the right-channel output of the unit to any input jack of the amplifier/ speaker except to the tape input. (The tape input is the only input not connected to the output jack below labeled "To Tape Recorder Input."

3. Turn the selector knob on the amplifier/ speaker to compare with the chosen input jack.

4. Connect the phono jack labeled "To Tape Recorder Input" on the amplifier/ speaker to the left-channel input on the unit.

CAUTION: With this monitor method, use only enough volume on the amplifier/ speaker that the volume can be heard, but not enough that the line recording is muddied with the microphone pickup of sound through the air.

5. Connect microphone to left-channel jack at the front of the unit.

6. Place Top Selector control in the Stereo position.

7. Place Bottom Selector control in Single position.

8. Place unit in Play mode. Adjust volume with the Right Channel Volume control; adjust the recording level with the Left Channel Recording Level control until normal recording level is indicated on recording level meter (29).

9. Rewind to the start of the first recording.

10. Adjust microphone, which is plugged into left-channel jack (at front), to normal recording level by using Left Channel Microphone Recording Level control.

11. Place unit in Record mode.

The right channel and the recording on the left channel can be heard at the same time. Sound produced through the microphone will be recorded simultaneously with the sound heard on the amplifier/ speaker.

This system retains the original sound on the right channel. If an error is made or if the operator wishes to rerecord, the tape is rewound, the unit is placed in the Record mode, and the new sound is recorded.

DISASSEMBLY INSTRUCTIONS

All servicing except cleaning of the heads, the tape holdback pad, and the capstan idler, and adjustment of the heads requires removal of the unit from the carrying case.

To Remove Tape Transport from Cabinet

1. Remove four screws from bottom of carrying case.

2. Place tape recorder on its side; grip tape transport with your fingers and slide it out.

To Remove Top Cover

1. Remove eight round knobs and two bar knobs.

2. Remove head cover (2) by squeezing the sides and tilting up and back.

3. Remove tape holdback cover (9), tape guide (8), and capstan idler (4).

4. Remove the speed change knob. Remove the set screw with an Allen wrench.

5. Remove two rear cover plate screws (11B) at rear of top cover; remove the screw under the head cover and the two screws (11A) under the knob.

6. Lift the top cover.

7. To reassemble, reverse the foregoing procedure.

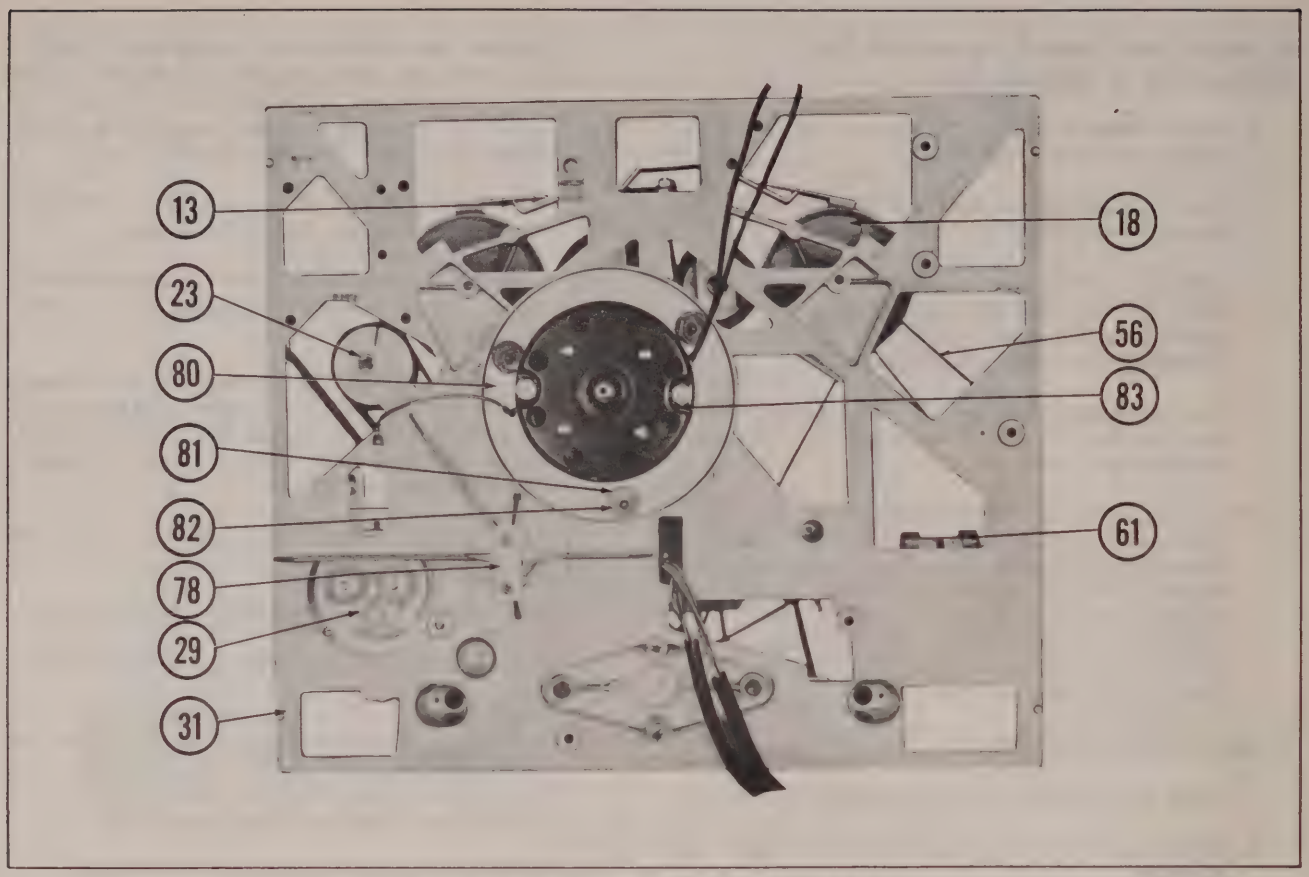


FIG. 3 BOTTOM VIEW OF BASEPLATE

TAPE TRANSPORT PERFORMANCE CHECKS

The mechanical operation of the components of the tape transport is fixed within strict design specifications, and there are no adjustments (except the head assembly, which is aligned during the electronic alignment procedure). However, a few simple checks should quickly determine whether the transport is operating properly or whether corrective maintenance will be required.

Some of the performance checks outlined may be made using alternate methods, depending upon the test equipment required (as detailed at the start of each discussion).

Tape Speed

Test equipment—electronic frequency counter.

1. The most accurate method of measuring tape speed is to reproduce a tape recorded at a frequency between 3,000 and 4,000 cps and to use an electronic frequency counter to determine the reproduced frequency. (A standard flutter tape recorded at 3,000 cps is an example of this type of tape).

NOTE: Tapes recorded on the recorder/reproducer itself and then reproduced will not determine whether the tape is moving at the correct speed.

2. An alternate method of measuring tape speed may be used if an electronic frequency counter is not available. An approximate tape speed indication may be obtained by timing (with a stop watch) the number of seconds a measured length of tape takes to pass a given point on the transport. Measure the tape in multiples of 7 1/2 ips, and play the tape for at least one minute.

NOTE: Human error, plus the tendency of stop watches to jump or lag when they are started, make this method rather inaccurate.

Tape Tension

Test equipment—an accurate 0-to 8-ounce spring scale and a reel of blank tape.

1. Place the reel of blank tape on the supply turntable. Thread the tape between the tape holdback and the tape guide and over the head assembly, but not between the capstan and capstan idler.

2. Loop the end of the tape by rolling it back over itself several times. Secure the loop with a piece of masking tape or other similar adhesive.

3. Place the hook on the spring scale through the loop; place the Top Selector control in its Monitor position.

4. Turn the Play-Record control until it locks in its clockwise position.

5. Using the spring scale, pull the tape from the supply reel and note the reading on the scale. The reading should be between 2 and 3 ounces while the tape is moving steadily.

Take-up Tension

Test equipment—an accurate 0 to 8 ounce spring an empty tape reel with a 2-inch hub diameter; a length of string (3 to 4 feet).

1. Place the empty reel on the take-up turntable.

2. Anchor the string on the reel, and wrap the string around the reel hub once or twice in a clockwise direction.

3. Tie a loop in the end of the string; place the hook on the spring scale through the loop, and place the Top Selector control in its Monitor position.

4. Turn the Play-Record control clockwise until it locks in position.

5. Let the spring scale follow slowly as the string is being wound on the reel, and take the scale reading. It should read approximately 3 ounce-inches.

NOTE: If the hub is two inches in diameter, the spring scale will indicate directly in ounce-inches. If the hub is smaller, wrap it with tape to the 2-inch diameter level. If the hub is larger, multiply the spring scale reading by the radius of the hub to determine the correct ounce-inch reading.

Brake Tension

Test equipment—an accurate 0-to 8-ounce spring scale. The following procedure applies to both the supply and to the take-up turntable brakes. The brakes are applied in the stopping position only; therefore, the controls do not have to be manipulated.

1. Remove top cover (11) from the tape transport (see "Disassembly Instructions"), and remove brake release control rods (34).

2. Place the hook on the spring scale through the hole on the brake assembly, or put a string through the hole as a loop for the scale.

3. Using the spring scale, pull the brake in a direction that will move the brake assembly directly away from the turntable. The scale should read from 5 to 8 ounces as the brake barely clears the turntable.

4. Repeat the foregoing procedure on the other turntable.

5. Replace brake release control rods (34).

Capstan Idler Pressure

Test equipment—accurate spring scale capable of measuring up to 3 pounds.

1. Remove top cover from the tape transport (see "Disassembly Instructions").

2. Turn the Play-Record control clockwise until it locks in position.

3. There are two holes in capstan idler arm (35), but only one hole is used. Place the hook of the spring scale through the empty hole.

4. Using the spring scale, pull the capstan idler in a direction that will move the idler away from the capstan. Scale reading should be from 2 pounds to 2 pounds 13 ounces as the idler barely clears the capstan.

TEST AND ADJUSTMENT PROCEDURE FOR THE AMPLIFIER

Clean All heads

1. Use Ampex Audio Part #823 head cleaner (or equivalent) and a cotton swab on a stick (Q-Tip or its equivalent).

Demagnetize All Heads

1. Use Ampex Audio Part #820 head demagnetizer (or equivalent). Avoid actually contacting the head surfaces with the demagnetizer tips unless the tips are protected by masking tape, transparent tape, etc.

Apply Power and Connect Test Cables

1. Connect AC power plug.

2. Connect output jack to an AC VTVM that will read an rms voltage of 0.002 or less.

Thread Standard Alignment Tape

1. Use standard alignment tape, #5563 (or equivalent), for 7 1/2 ips; #6000 (or equivalent) for 3 3/4 ips.

Place In Play Mode and Check Tape Tracking

Tape must be centered on all three heads. This centering should occur with between one and two laminations visible on each side of the tape on the erase and record heads. On the universal playback head, the upper edge of the tape should coincide with the joint of the mu-metal and copper lamination when the head is in the upper position; and the heads must be parallel to the capstan.

Check the operation of all tape motion controls, with the exception of the Record Button, to make certain

that the tape handles smoothly at all times.

Check Playback Response

1. Set AC VTVM to 0 (1 volt rms) scale.
2. Set Selector Switch to Stereo (Universal Playback lever should be in the down position.)
3. On the 250-cycle tone (second tone on standard tape), adjust the Volume control for —2 dbm (.62 volt rms) on an AC VTVM, and check both left and right channel outputs; levels should be within ± 2 db of each other.
4. Rewind tape to 10,000-cycle tone, align the playback head aziumuth by adjusting the right rear screw of the three head mounting screws. If this adjustment is off, the Volume control should be reset.

NOTE: From this point on, do not change the Volume Control setting.

5. Check the frequency response, which should be ± 2 db between 50 and 10,000 cycles per second. Regard each channel response separately. Be sure to allow for the difference in level (if any) between the two channels at 250 cycles.

Playback Noise

1. Stop the tape.
2. Be sure the mu-metal head cover and electronic shield are installed.
3. VTVM should read below —48 dbm, .002V at 7 1/2 ips.
4. VTVM should read below —43 dbm, .005V at 3 3/4 ips.

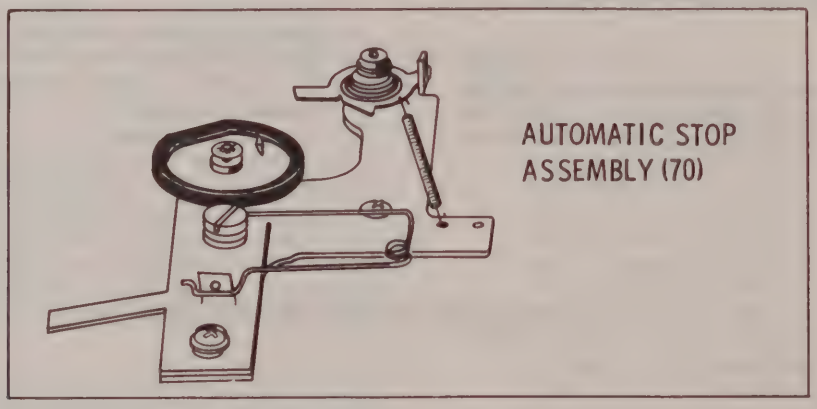
NOTE: It is important to listen for any noises, such as resistor, tube microphonic, etc., noises, which would be objectionable. Since this is an audio recorder, the actual sound is as important as the meter reading.

Record Level Meter Calibration

1. Set audio oscillator to 250 cycles.
2. Place recorder in Record mode, and adjust phono Record Level control for —2 dbm (.62 rms) at output jack of recorder.
3. Adjust Meter Calibrate Control R4 for record level meter reading at upper edge of black mark. With a stereo unit, the bias adjustment may be set to ± 0.25 db to equalize the recording level meter reading between the two channels. If the bias must be adjusted, recheck the over-all frequency response (Step 9 under "Record Function").

Flutter and Wow Check

Flutter and wow should be checked with a flutter meter. Use the recommended procedure of the flutter meter manufacturer. Flutter measurements should be: at 7 1/2 ips, less than 0.2% rms; at 3 3/4 ips, less than 0.25% rms.



TROUBLE CHART

Symptom	Cause	Remedy
Abnormal tape speed.	1. Low line voltage.	1. Line voltage must be at least 105 volts.
	2. Capstan drive belt (33) slips.	2. Clean associated pulley surfaces; replace capstan drive belt (33) if necessary.
	3. Incorrect pressure on capstan idler assembly (4).	3. Replace capstan idler spring (36).
	4. Defective drive motor (83).	4. Replace drive motor (83).
	5. Excessive tape holdback tension.	5. Check tape tension.

TROUBLE CHART (CON'T.)

Symptom	Cause	Remedy
Capstan does not rotate when Top Selector is in On position.	1. Power cable not connected, or defective fuse.	1. Connect cable, or replace fuse.
	2. Capstan drive belt (33) jammed because speed selector was turned while capstan was not rotating.	2. Return speed selector to 3 3/ 4- ips position. When capstan starts moving, turn speed selector to desired speed.
	3. Capstan drive belt (33) broken.	3. Replace capstan drive belt(33).
	4. Defective motor (83).	4. Replace drive motor (83).
Defective power supply.	1. Power cable not connected.	1. Connect power cable.
	2. Defective fuse M2.	2. Replace fuse M2.
	3. Defective power transformer Tl.	3. Replace power transformer Tl.
	4. Defective rectifier tube.	4. Replace rectifier tube.
No recording meter indication when microphone is being used.	1. Unit not in Record.	1. Place unit in Record.
	2. Defective tube V4, V5 (Left Channel); V6, V7 (Right Channel), V8 (VU Amp), VU Meter or associated components.	2. (a) Record a section of tape at approximately the normal level. Play back the tape. If the recording sounds normal, check VU Meter Amp (V8), VU Meter and associated circuit. (b) If recording does not sound normal, check V4, V5 (Left Channel) or V6, V7 (Right Channel) and associated circuits.
Fails to record.	1. Defective tube V4, V5, V6, V7, V9 or associated components.	1. Replace defective tube or components.
	2. Defective recording head.	2. Replace recording head.
Does not play back when tape known to be properly recorded is on the unit. Tape is moving normally.	1. Upper track only is defective—indicates defective tube Vl or V2; defective components in these stages; defective head.	1. Replace any defective parts.
	2. Lower track only is defective—indicates defective tube V2 or V3 defective components; defective head.	2. Replace any defective parts.
	3. Both tracks defective—indicates defective tube.	3. Replace tube.
Does not erase.	1. Defective tube V9 , or defective components.	1. Replace defective tube or components.
	2. Contacts on Record-Play switch M6 are not making contact or are dirty.	2. Clean contacts; make sure contacts make proper contact.
	3. Defective erase head.	3. Replace erase head.

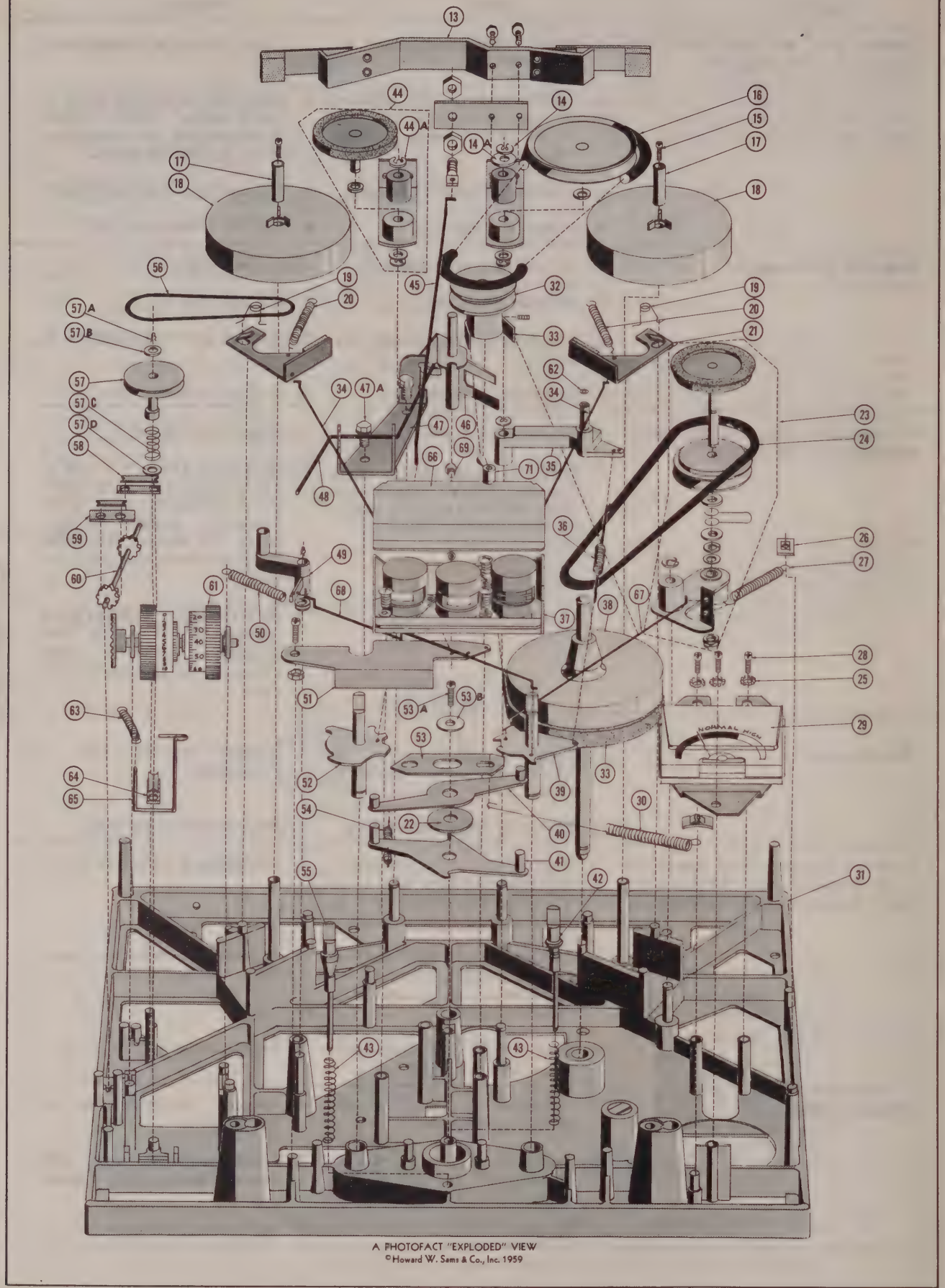


FIG. 4A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

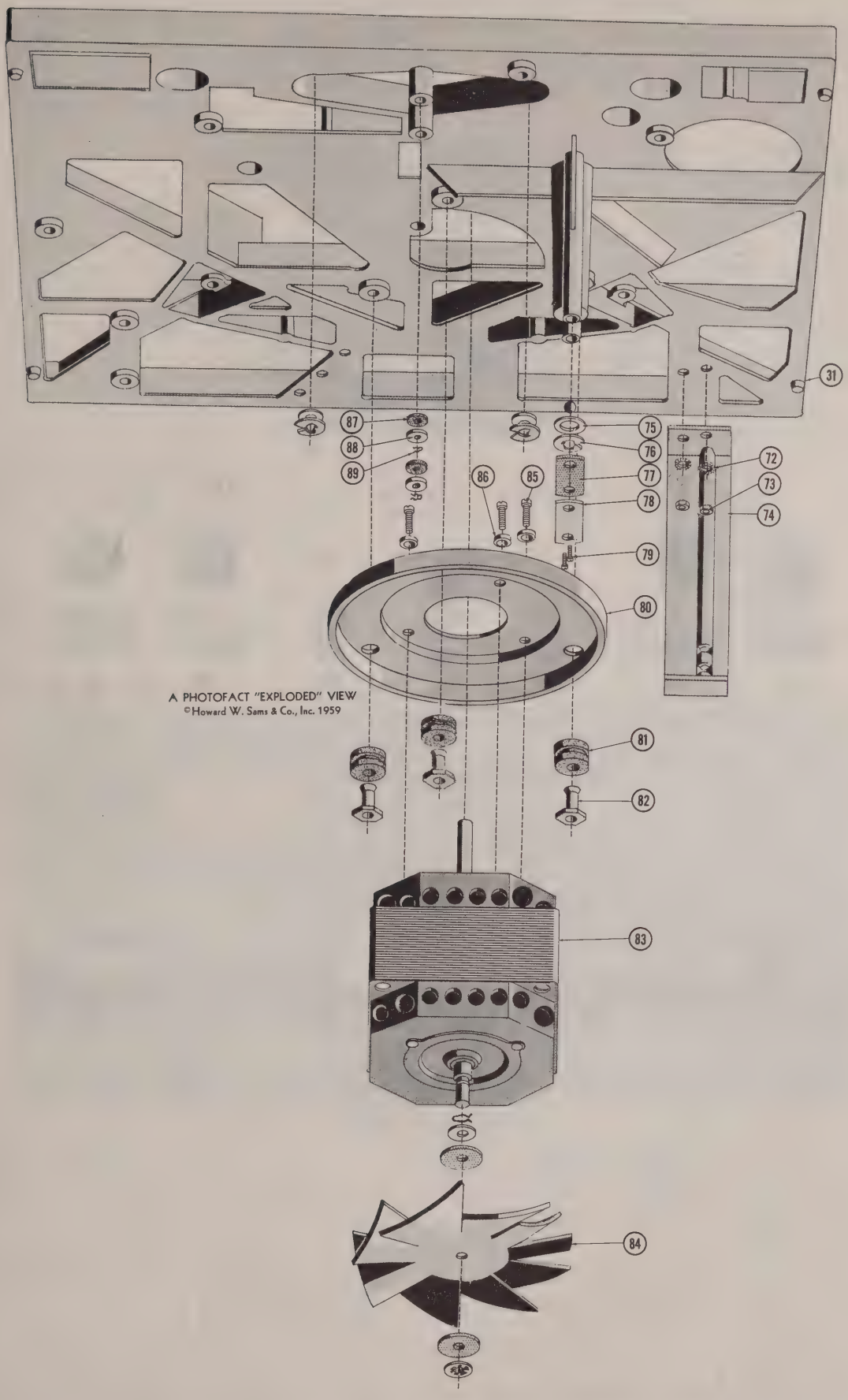
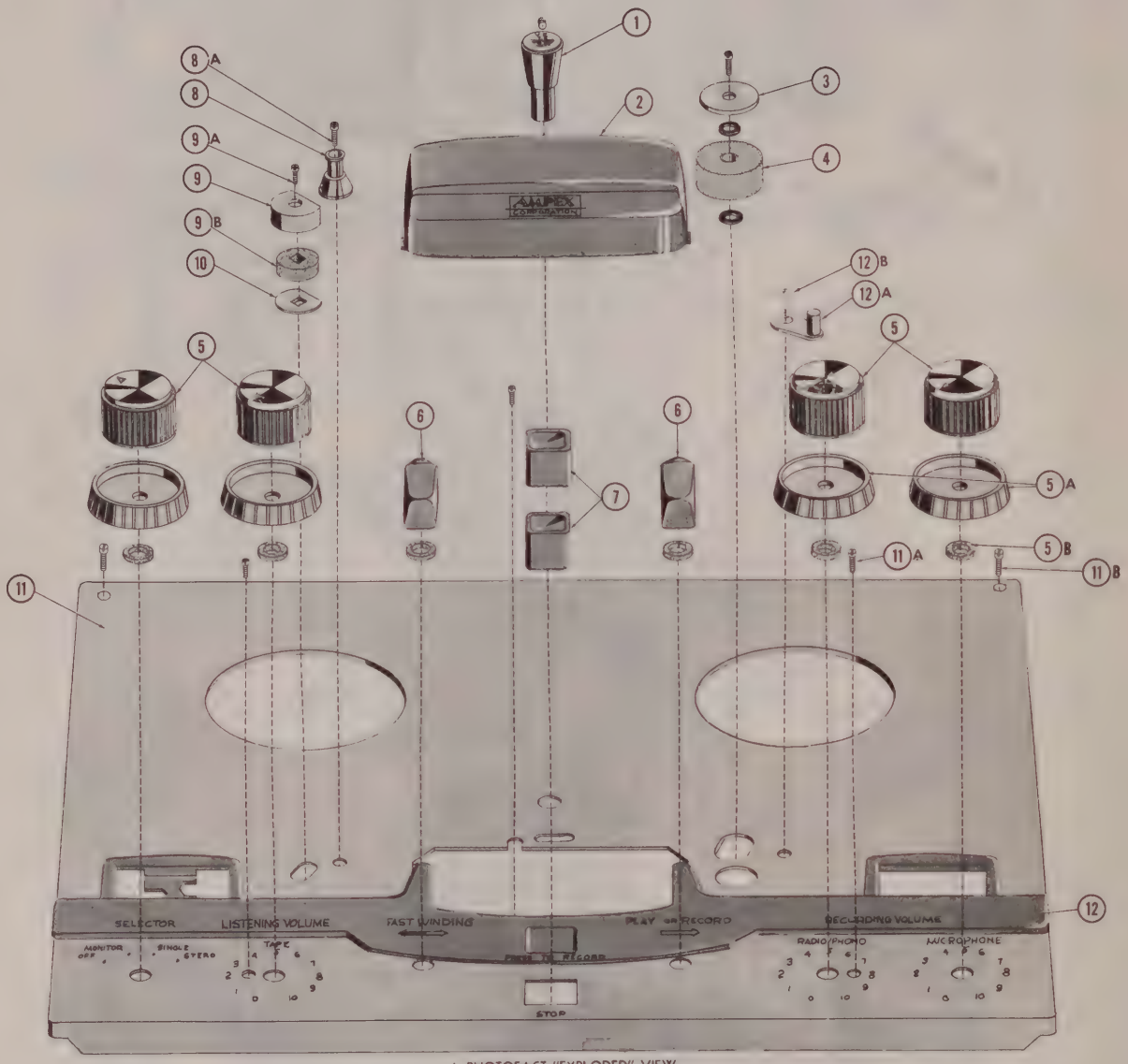


FIG. 4B EXPLODED VIEW OF PARTS BELOW BASEPLATE



A PHOTOFACT "EXPLODED" VIEW
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FIG. 4C EXPLODED VIEW OF PARTS ABOVE COVER ASSEMBLY

TROUBLE CHART(CON'T.)

Symptom	Cause	Remedy
Insufficient braking force. Tape loops when unit is stopped in any mode.	1. Brake lining worn on brake arm assembly (21).	1. Replace worn brake lining.
	2. Brake arm assembly (21) not free to move with rotation of turntable. Brake de-energizing spring (20) not positioned properly.	2. Reposition or replace brake de-energizing spring (20).
Wrong take-up tension: tape loops when unit is starting.	1. Take-up "O" ring (24) slips or is broken.	1. Clean pulley surfaces; replace "O" ring if necessary.
	2. Rubber tire on play take-up idler assembly (23) slips or is worn.	2. Clean the tire and the take-up turntable; replace play take-up idler assembly (23) if necessary.
	3. Defective play take-up spring (27).	3. Replace play take-up spring (27).
Poor high-frequency response.	1. Heads and tape not making proper contact.	1. Clean the heads.
	2. Improper bias adjustment.	2. Adjust the bias.
	3. Improper head alignment.	3. Align the heads.
	4. Faulty reproduce amplifiers.	4. Use standard audio trouble-shooting procedures.
	5. Faulty record amplifier (would be indicated if reproduction is normal).	5. Use standard audio trouble-shooting procedures.
Flutter and wow.	1. Dirt on the components in the tape threading path.	1. Clean these components thoroughly.
	2. Flutter frequency, 21.36 cps at 7 1/2 ips. Flat or dented capstan idler (4). Capstan revolves at 142 rpm.	2. Replace capstan idler (4).
	3. Flutter frequency, 5.7 cps at 7 1/2 ips. Capstan drive belt (33) defective (moves at approximately 343 rpm).	3. Replace defective capstan drive belt (33). Make sure the drive belt is tracking properly.

MECHANICAL PARTS LIST ABOVE COVER ASSEMBLY

Ref. No.	Part Number Grey	Part Number Beige	Description
1	10-0009-1	10-0009-3	Speed Control Button
2	29-0034-3	29-0034-5	Head Cover, With Opening for Head Shift Rod, Universal Playback, Polystyrine
3	29-0032-1	29-0032-3	Capstan Idler Cover
4	04-0020-1	04-0020-1	Capstan Idler Assembly, 1-1/16" dia.

Ref. No.	Part Number Grey	Part Number Beige	Description
5	10-0005-5	10-0019	Top Selector Listening; Radio-Phono and Microphone Record Level Control
5A	10-0024	10-0021	Bottom Selector Listing; Radio-Phono and Microphone Record Level Control Knob With Arrow
5B	44-0026-1	44-0026-1	Felt Washer

MECHANICAL PARTS LIST ABOVE COVER ASSEMBLY (CON'T.)

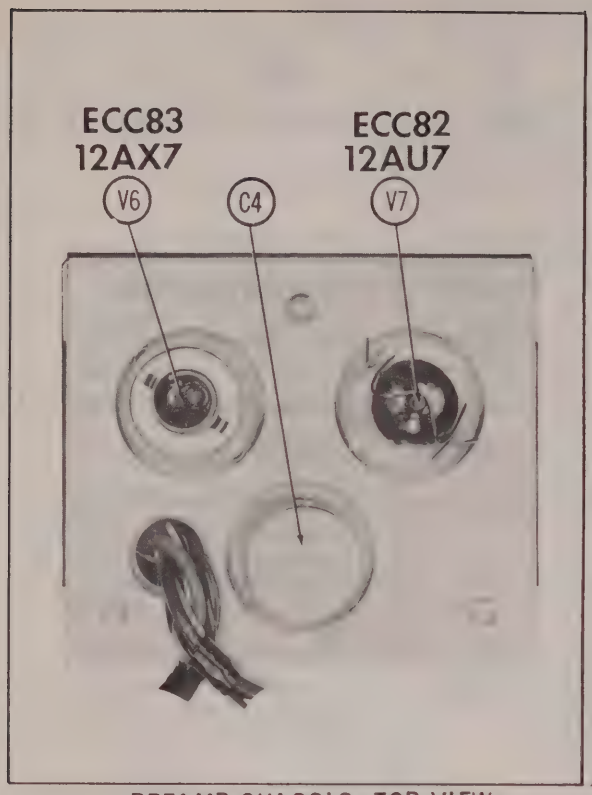
Ref. No.	Part Number Grey	Part Number Beige	Description
6	10-0008-1	10-0008-3	Fast Winding, Play or Record Control Bar Knob With #27-0005 Spring
7	10-0007-1	10-0007-3	Stop and Record Lock Push Buttons
8	21-0004	21-0004	Tape Guide
8A	40-0056	40-0113	4-40 x 3/4" Phillips Screw
9	29-0033-1	29-0033-3	Tape Holdback Cover
9A	40-0055	40-0112	4-40 x 1/4" Phillips Screw
9B	44-0026-2	44-0026-2	Felt Tape Holdback Washer
10	33-0004-1	33-0004-1	Tape Holdback Base
11			Cover Assembly With Escutcheon Models 952, 954, 960 Stereo Record, Universal Playback With Automatic Stop Assembly
11A			6-32 x 3/8" Screw, Washer #40-0031
11B	40-0080	40-0114	6-32 x 1/4" Rear Cover Plate Screw
12	11-0017-1	11-0017-3	Escutcheon
12A	04-0057-1	04-0057-3	Automatic Stop Arm Assembly
12B			4 x 40 x 1/4" Machine Screw

MECHANICAL PARTS LIST BELOW COVER ASSEMBLY

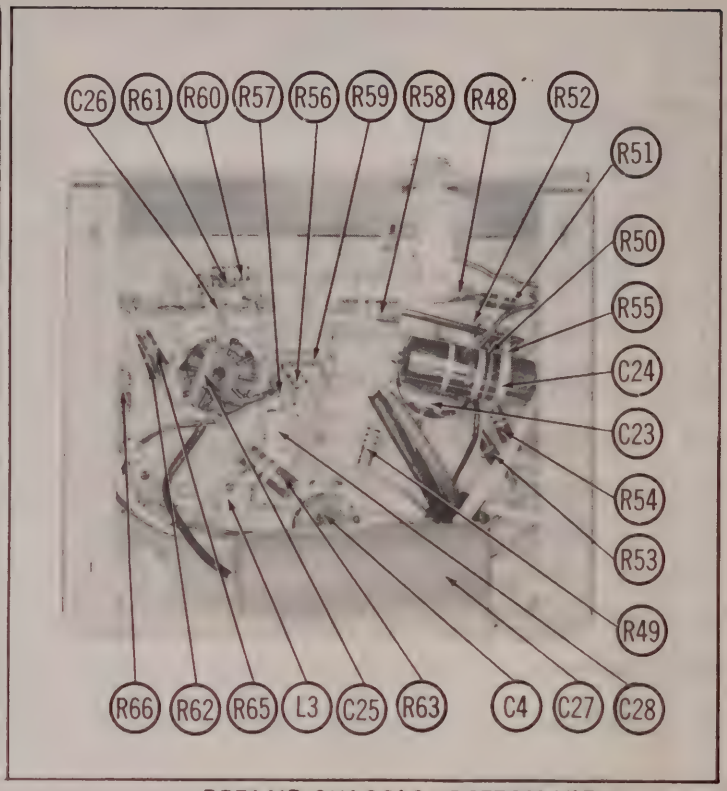
Ref. No.	Part No.	Description
13	03-0003-1	Fast Wind Pulley Assembly, Includes Pulley, Brake Arm Assembly Fast Wind Holdback Felets
14		"E" Ring Retainer, .187 Shaft
14A	44-0032	Bowed Tension Washer
15	40-0055	4-40 x 1/4" Chrome Screw Turntable Shaft (Grey)
	40-0112	4-40 x 1/4" Brass Screw Turntable Shaft (Beige)
16	31-0001-1	"O" Ring, Fast Forward
17	21-0019-1	Chrome Cap, Turntable Shaft (Grey)
	21-0019-3	Brass Cap, Turntable Shaft (Beige)
18	04-0026-1	Turntable Assembly (Grey)
	04-0026-3	Turntable Assembly (Beige)
19	27-0014-1	Brake Spring, 2 Required
20	27-0016-1	Brake De-energizing Spring
21	04-0030-1	Take-up, Brake Arm Assembly, with #13-0014-1 Lining
22	44-0024-3	Washer
23	03-0005-1	Play Take-up Idler Assembly
24	31-0002	"O" Ring Take-up
25	44-0031	Lock Washer
26	32-0001	Push-on Retainer
27	27-0013-1	Play Take-up Spring
28	40-0054	6-32 x 1/4" Machine Screw
29	14-0001-1	Recording Level Meter (Grey)
	14-0001-4	Recording Level Meter (Beige)
30	27-0010-1	Shuttle Return Spring
31	04-0034-1	Baseplate Subassembly
32	25-0013-1	Pulley, Motor, 60 Cycle, Used with General Industries Motor
	25-0013-2	Pulley, Motor, 50 Cycle, Used with General Industries Motor
	25-0013-3	Pulley, Motor, 60 Cycle, Used with Howard Motor
	25-0013-4	Pulley, Motor, 50 Cycle, Used with Howard Motor
33	31-0004-1	Capstan Drive Belt
34	21-0022-1	Brake Release Control Rod
35	04-0025-1	Capstan Idler Arm
36	27-0025-1	Capstan Idler Spring
37	02-0062-7	Stereo Record, Stereo Erase, Universal Playback (Four-Track Playback)
38	04-0024-1	Capstan Assembly

Ref. No.	Part No.	Description
39	04-0028-1	Play Control Cam Assembly
40	04-0032-1	Upper Cam Control Arm Assy.
41	04-0031-1	Lower Cam Control Arm Assy.
42	23-0018-1	Shaft Record Cam
43	27-0012-1	Shaft Return Spring
44	03-0004-1	Rewind Idler Assembly
44A	32-0006-1	"E" Ring Retainer, .187 Shaft
45	21-0023-1	Fast Wind Control Rod
46	04-0033-1	Yoke Subassembly, Dual Speed, For Both 60 or 50 Cycle
47	26-0012-1	Detent Bracket
47A	40-0067	Self-Tapping Screw #8-1/4"
48	23-0021-1	Dual Speed Detent and Equalization Wire
49	23-0019-1	Holdback Arm
50	27-0011-1	Holdback Tension Spring
51	23-0020-1	Brake Lever
52	04-0028-1	Play Control, Cam Assembly
53	23-0016-1	Interlock Shuttle
53A	40-0054	6-32 x 1/4 Phillips Machine Screw
53B	44-0029-3	Washer
54		
55	23-0017-1	Shaft Stop Cam
56	31-0003	"O" Ring Position Indicator
57	04-0023	Worm Pulley Assembly
57A	32-0007	Hairpin Retainer Steel
57B	44-0027-3	Cambric Washer
57C	24-0003	Worm Counter Drive Spring
57D	44-0027-3	Cambric Washer
58	27-0004-1	Retainer Spring
59	13-0016-1	Retainer Pad
60	03-0001-1	Counterdrive Jack Shaft Assy.
61	02-0042-2	Position Indicator Assy. (Grey)
	02-0042-4	Position Indicator Assy. (Beige)
62	44-0027-3	Cambric Washer

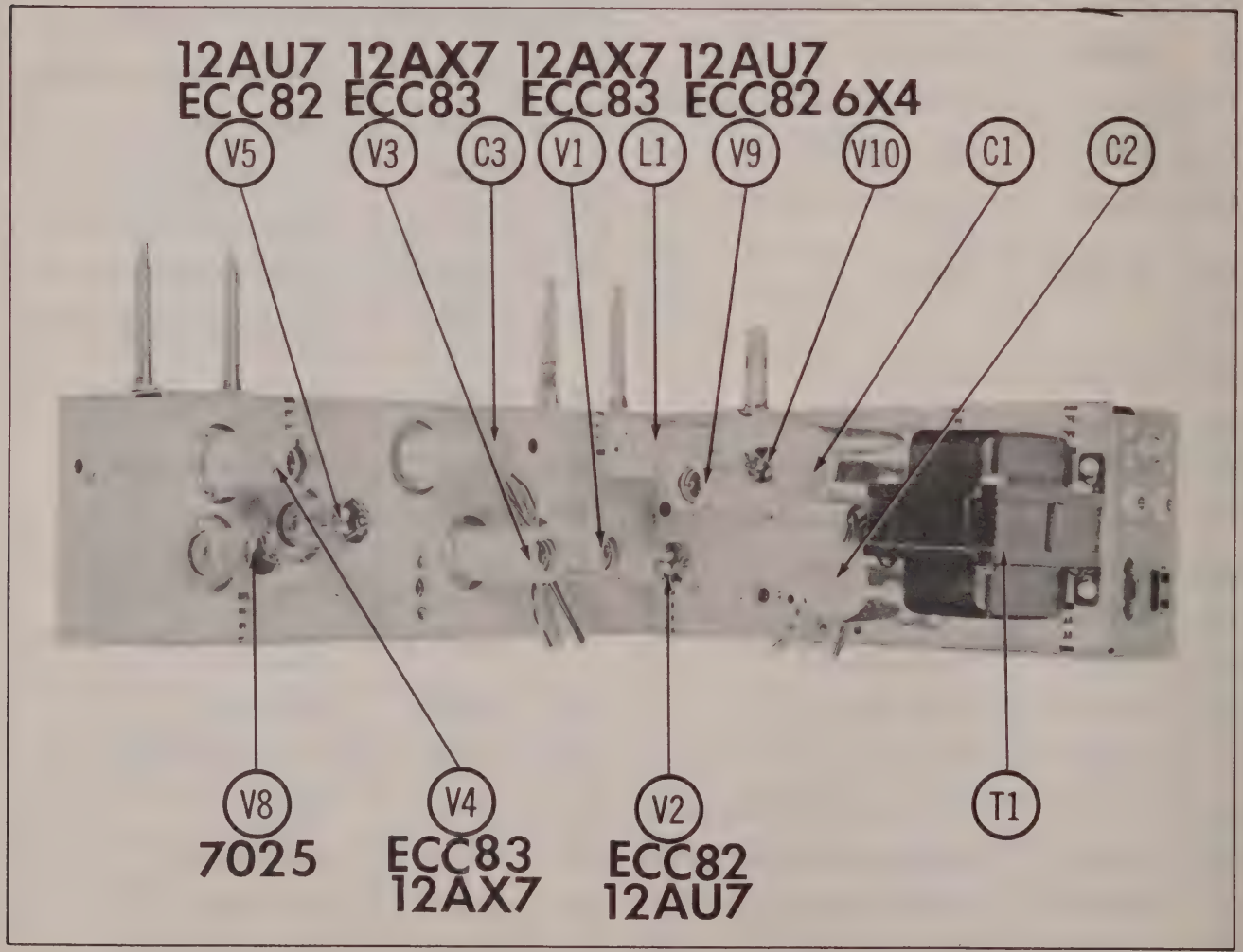
Ref. No.	Part No.	Description
63	27-0003-1	Position Indicator Latch Spring
64	27-0004-1	Retainer Spring
65	23-0002-1	Latch Escapement
66	04-0021-2	Mu-Metal Head Cover
67	21-0020-1	Play Take-up Control Rod
68	21-0021-1	Holdback Tension Control Rod
69	40-0054	6-32 x 1/4" Screw
70	02-0059-1	Automatic Stop Assembly (Available As a Complete Assembly Only). Does Not Include Shutoff Lever Arm or Screw. See Ref. No. 12A and 12B
71	21-0033-1	Head Shift Rod, Operates Head Shift Post and Plate Assembly #04-0058
72		Washer; Included With Ref. No. 73
73	42-0004	Kep Nut With Washer
74	26-0013-1	Transport Mounting Bracket
75	44-0027-2	Cambric Washer
76	32-0008	"E" Ring Retainer
77	33-0007-1	Capstan Thrust Retainer, Nylon
78	33-0007-2	Capstan Thrust Retainer, Steel
79	40-0065-1	6-32 x 3/8" Screw, Washer No. 40-0031 Needed
80	33-0005-1	Motor Assembly Mounting Plate
81	13-0017	Motor Shock Mounts
82	42-0016-1	Sleeve Nut
83	59-0001-1	Drive Motor, General Industries
	59-0001-3	Drive Motor, Howard Industries
84	25-0003	Motor Fan
85	40-0063	8-32 x 5/16" Phillips Screw
86	44-0031	Washer
87	44-0030	Rubber Washer
88	44-0029-2	Steel Washer
89	32-0007	Hairpin Retainer



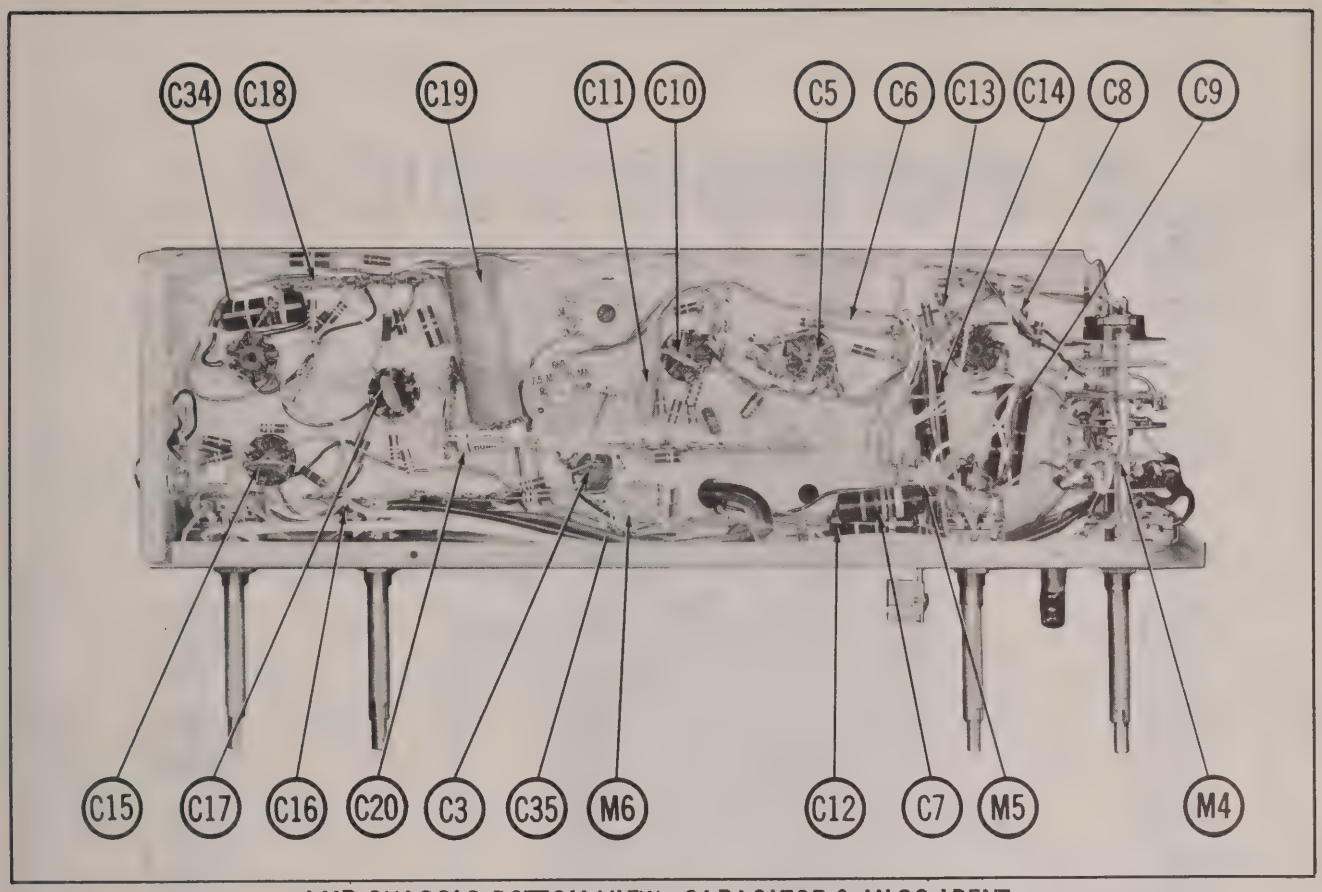
PREAMP CHASSIS - TOP VIEW



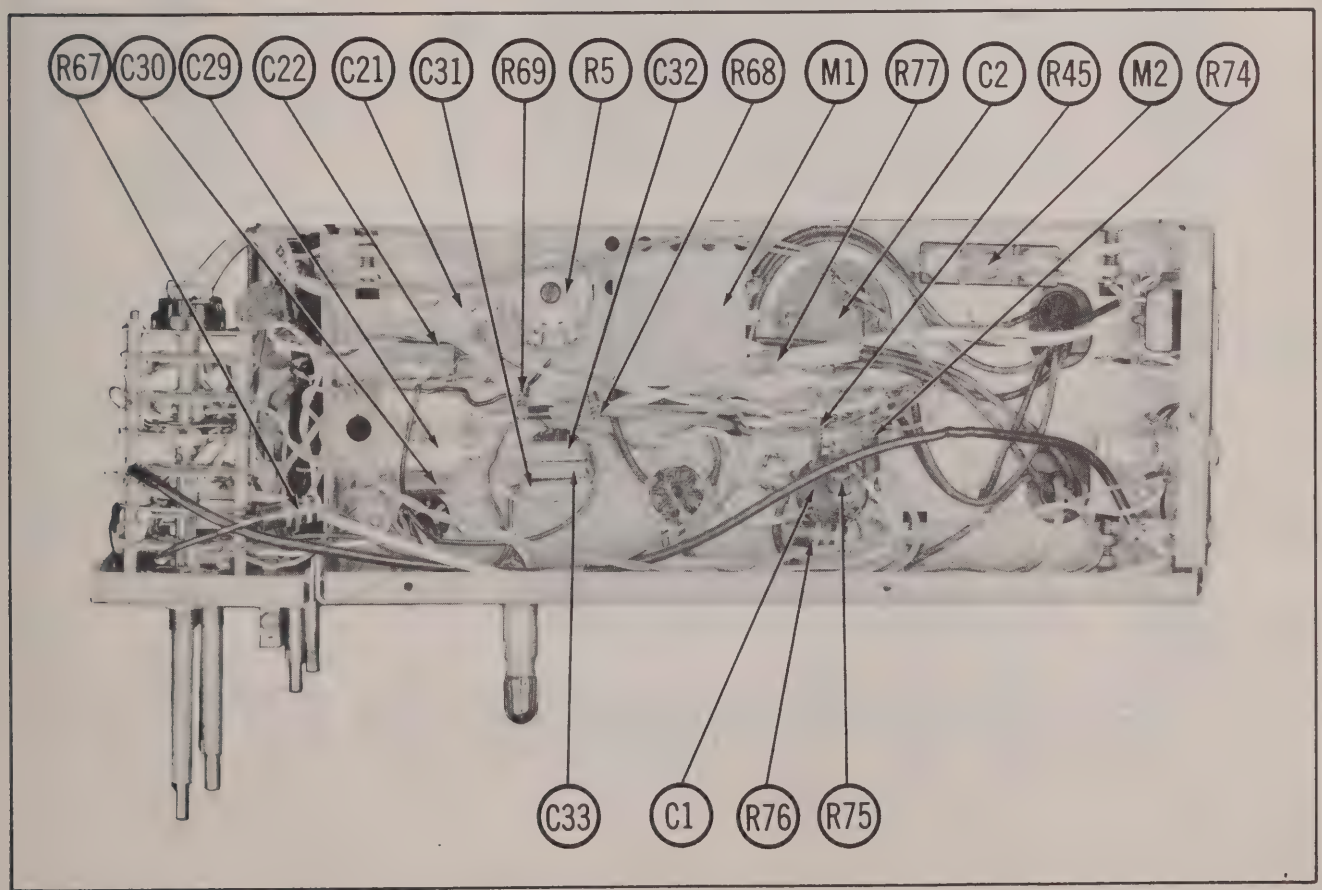
PREAMP CHASSIS - BOTTOM VIEW



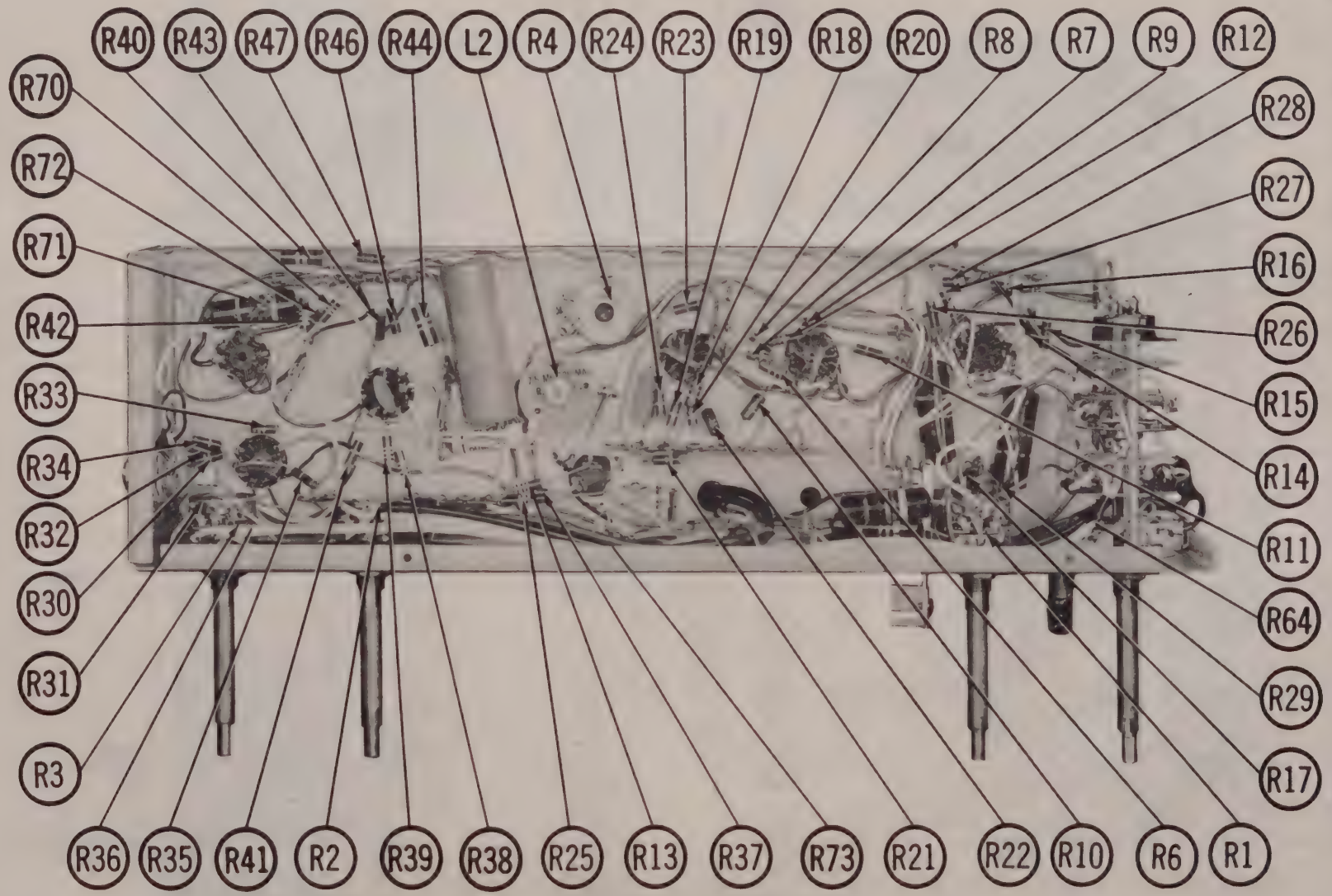
ELECTRICAL CHASSIS - TOP VIEW



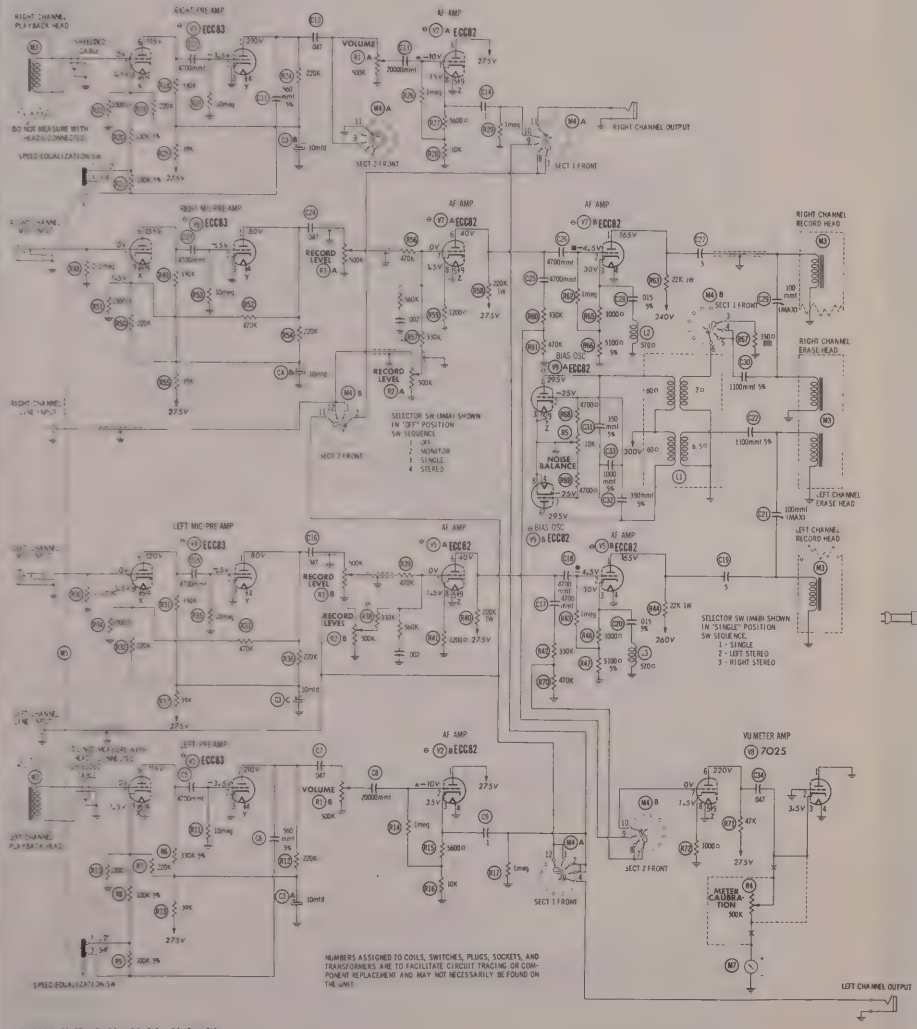
AMP CHASSIS BOTTOM VIEW - CAPACITOR & MISC IDENT.



POWER CHASSIS - BOTTOM VIEW



AMP CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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RESISTANCE READINGS

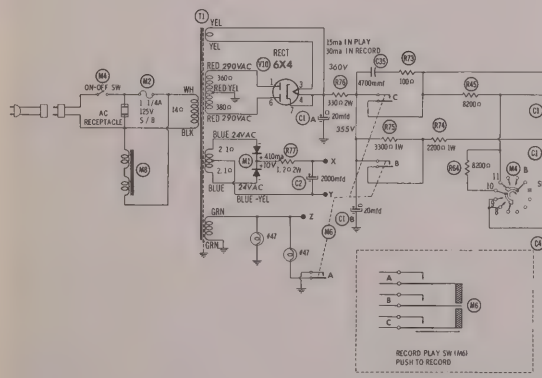
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 / 12AX7	*265K	10meg	0Ω	4.5Ω	4.5Ω	*375K	1MF	1000Ω	0Ω
V2	ECC82 / 12AU7	▲5800Ω	1meg	15K	0Ω	0Ω	▲5800Ω	1meg	15K	1Ω
V3	ECC83 / 12AX7	*265K	10meg	0Ω	4.5Ω	4.5Ω	*375K	1MF	1000Ω	6.5Ω
V4	ECC83 / 12AX7	*265K	10meg	0Ω	4.5Ω	4.5Ω	*375K	0Ω	1000Ω	6.5Ω
V5	ECC82 / 12AU7	▲30K	1meg	6100Ω	0Ω	0Ω	▲225K	200K	1200Ω	1Ω
V6	ECC83 / 12AX7	*265K	10Meg	0Ω	4.5Ω	4.5Ω	*375K	0Ω	1000Ω	6.5Ω
V7	ECC82 / 12AU7	▲30K	1meg	6100Ω	0Ω	0Ω	▲225K	200K	1200Ω	1Ω
V8	7025	0Ω	0Ω	180K	0Ω	0Ω	*53K	470K	1000Ω	1Ω
V9	ECC82 / 12AU7	▲400Ω	10K	0Ω	0Ω	0Ω	▲400Ω	10K	0Ω	1Ω
V10	6X4	360Ω	NC	¶	¶	NC	380Ω	¶		

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
* MEASURED FROM PIN 7 OF V10.
▲ MEASURED FROM PIN 3 OF V2.
– MEASURED FROM PIN 8 OF V2.
● MEASURED FROM PIN 3 OF V5.
■ MEASURED FROM PIN 3 OF V7.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM



AMPEX MODELS 932, 934, 960

ELECT. PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Left Ch. Preamplifier	ECC83/12AX7
V2	Left Ch. Cath. Follower-Right Ch. Cath. Follower	ECC82/12AU7
V3	Right Ch. Preamplifier	ECC83/12AX7
V4	Left Ch. Preamplifier	ECC83/12AX7
V5	Left Ch. AF Amplifier	ECC82/12AU7
V6	Right Ch. Preamplifier	ECC83/12AX7
V7	Right Ch. Amplifier	ECC82/12AU7
V8	VU Meter Amplifier	7025
V9	Bias Oscillator	ECC82/12AU7
V10	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	AMPEX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■20	450	55-0003	AFH4-14	D0177	FP444	TMQ-12	TVL-4763	
B	▬20	450							
C	20	450							
D	▲20	450							
C2	2000	15	55-0002	AFH1-03	A0070	WP041	TMS-5	TVL-1168	
C3A	10	350	55-0001	AFH3-27	C0210	FP330.5	TMT-27	TVL-3776	
B	▬10	350							
C	▲10	350							
C4A	■20	450		AFH2-50	B0390	FP231.3	TMD-49	TVL-2754	
B	▲10	450							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	AMPEX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	4700			54-0006	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C6	560		5%	54-0002	1469-00056		1R5T56		MS-356	
C7	.047	400		54-0003	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C8	20000			54-0011	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C9	.1	400		54-0010	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C10	4700			54-0006	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C11	560		5%	54-0002	1469-00056		1R5T56		MS-356	
C12	.047	400		54-0003	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	

CAPACITORS (cont)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	AMPEX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C13	20000			54-0011	BPD-02	DD-203	BYB6S2	B-120	5HK-S1	
C14	.1	400		54-0010	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C15	4700			54-0006	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C16	.047	400		54-0003	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C17	4700			54-0006	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C18	4700			54-0006	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C19	.5	400		54-0001	P488N-5		CUB4P5	GEM-405	4TM-P5	
C20	.015	200	5%	54-0005	V84C2S15 5%				2WF-S15	
C21	100			54-0008						
C22	1100		5%	54-0031	1464-0011		1R5D11		MS-211	
C23	4700			54-0006	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C24	.047	400		54-0003	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C25	4700			54-0006	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C26	4700			54-0006	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C27	.5	400		54-0001	P488N-5		CUB4P5	GEM-405	4TM-P5	
C28	.015	200	5%	54-0005	V84C2S15 5%				2WF-S15	
C29	100			54-0008					MS-31	
C30	1100		5%	54-0031	1464-0011		1R5D11		MS-211	
C31	350		5%	54-0009	1469-00035				MS-335	
C32	350		5%	54-0009	1469-00035				MS-335	
C33	1000		5%	54-0007	1469-001		1R5D1	MCE255	MS-210	
C34	.047	400		54-0003	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C35	4700			54-0006	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AMPEX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	52-0016-2				UE1732	Volume
B	500K	½						Volume
R2A	500K	½	52-0016-2				UE1732	Recording Level
B	500K	½						Recording Level
R3A	500K	½	52-0016-2				UE1732	Recording Level
B	500K	½						Recording Level
R4A	500K	½	52-0005		B47-500K-Z	B13-133	TA55A	Meter Calibration
B	Shaft				Not Req.	TM-1	Not Req.	
R5A	10K	½	52-0002		B47-10K-S	B11-116	SU-20	Noise Balance
B	Shaft				Not Req.	TM-1	Not Req.	

ELECT. PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	AMPEX PART No.	NOTES
R6	330K 5%			
R7	220K		51-0020	
R8	100K 5%		51-0028	
R9	100K 5%		51-0028	
R10	1000Ω		51-0017	
R11	10meg			
R12	220K		51-0020	
R13	39K		51-0019	
R14	1meg		51-0012	
R15	5600Ω		51-0059	
R16	10K		51-0058	
R17	1meg		51-0012	
R18	330K		51-0024	
R19	220K		51-0020	
R20	100K 5%		51-0028	
R21	100K 5%		51-0028	
R22	1000Ω		51-0017	
R23	10meg			
R24	220K		51-0020	
R25	39K		51-0019	
R26	1meg		51-0012	
R27	5600Ω		51-0059	
R28	10K		51-0058	
R29	1meg		51-0012	
R30	2.2meg		51-0027	
R31	330K		51-0024	
R32	220K		51-0020	
R33	470K		51-0021	
R34	1000Ω		51-0017	
R35	10meg			
R36	220K		51-0020	
R37	39K		51-0019	
R38	330K		51-0024	Note 1
R39	470K		51-0021	
R40	220K	1	51-0020	
R41	1200Ω		51-0060	
R42	330K		51-0024	
R43	1meg		51-0012	
R44	22K	1	51-0022	
R45	8200Ω		51-0002	
R46	1000Ω		51-0017	
R47	5100Ω 5%		51-0015	
R48	2.2meg		51-0027	
R49	330K		51-0024	
R50	220K		51-0020	
R51	1000Ω		51-0017	
R52	470K		51-0021	
R53	10meg			
R54	220K		51-0020	
R55	39K		51-0019	
R56	470K		51-0021	
R57	330K		51-0024	Note 1
R58	220K	1	51-0067	
R59	1200Ω		51-0060	
R60	330K		51-0024	
R61	470K		51-0021	
R62	1meg		51-0012	
R63	22K	1	51-0022	
R64	8200Ω		51-0002	
R65	1000Ω		51-0017	
R66	5100Ω 5%		51-0015	
R67	330Ω	2		
R68	4700Ω		51-0001	
R69	4700Ω		51-0001	
R70	470K		51-0021	
R71	47K		51-0013	
R72	1000Ω		51-0017	
R73	100Ω		51-0014	
R74	2200Ω	1	51-0004	
R75	3300Ω	1	51-0005	
R76	330Ω	2		
R77	1.2Ω	2		

Note 1. Some versions may use 470K in this application (Part #51-0021).

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA AMPEX PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Bias Osc.	58-0016						
L2	Tone Choke	58-0001	19-2078	19-2078	BC-505	660		7.5MH
L3	Tone Choke	58-0001	19-2078	19-2078	BC-505	660		7.5MH

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA AMPEX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .43A	580 VCT @ .030A	6.3V @ .6A	58-0003						
	SEC. 3	SEC. 4	SEC. 5							
	24 VCT @ .5A	6.3V @ 1.7A								

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA AMPEX PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.410A	57-0001	1017	C1B	604B		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA AMPEX PART No. FUSE	AMPEX PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	1 1/4A 125V S/B	61-0001	63-0003	3131.25 (3AG 1 1/4A 125V) S/B	357001	MDH 1 1/4	4A05

MISCELLANEOUS

ITEM No.	PART NAME	AMPEX PART No.	NOTES
M3	Head Assembly	02-0062-7	Stereo Record, Stereo Erase, Universal Play Back (Four-Track Playback)
M4A	Switch	62-0002	Off-Monaural-Single-Stereo (Wafer Type)
B	Switch	62-0003	Single-Left-Right (Wafer Type)
M5	Switch	62-0004	Speed Equalization (DPST)
M6	Switch	62-0001	Leaf Type (3 PST)
M7	Meter	14-0001-1	Recording Level, Grey
	Meter	14-0001-2	Recording Level, Brown
	Meter	14-0001-4	Recording Level, Beige
M8	Motor	59-0001-1	(General Industries)
	Motor	59-0001-3	(Howard Industries)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	10-0005-5	Grey, Top Selector Listening, Radio-Phono, Microphone Record Level Input
Knob	10-0019	Beige, Top Selector Listening, Radio-Phono, Microphone Record Level Input
Knob	10-0024	Grey, Bottom Selector Listening, Radio-Phono, Microphone Record Level Input
Knob	10-0021	Beige, Bottom Selector Listening, Radio-Phono, Microphone Record Level Input
Knob Ass'y.	10-0008-1	Grey; Fastwinding, Play or Record (With Spring #27-0005).
Knob Ass'y.	10-0008-3	Beige; Fastwinding, Play or Record (With Spring #27-0005).
Knob Ass'y.	10-0008-2	Brown; Fastwinding, Play or Record (With Spring #27-0005).
Pushbutton	10-0007-1	Grey; Stop, Record Lock (With Spring #27-0005).
Pushbutton	10-0007-3	Beige; Stop, Record Lock (With Spring #27-0005).
Pushbutton	10-0007-2	Brown; Stop, Record Lock
Knob	10-0009-1	Grey, Speed Control
Knob	10-0009-3	Beige, Speed Control
Knob	10-0009-2	Brown, Speed Control

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

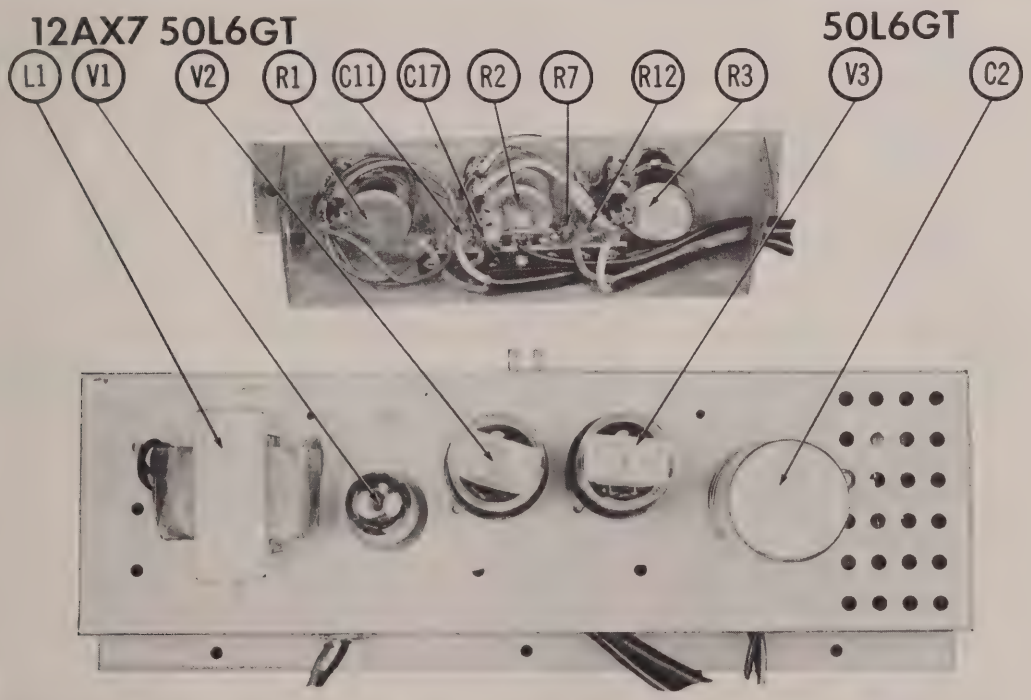
PHOTOFACT* Folder

COLUMBIA RECORDS
MODEL 626

COLUMBIA RECORDS
MODEL 626

TRADE NAME	Columbia Model 626
MANUFACTURER	CBS-Hytron, 100 Endicott St., Danvers, Massachusetts
TYPE SET	AC Operated 3 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 43 Watts, .45 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE V-M 1201 - PHOTOFACT SET 436 FOLDER 18



COLUMBIA RECORDS
MODEL 626

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Right Channel AF Amp. - Left Channel AF Amp.	12AX7	
V2	Right Channel Output	50L6GT	
V3	Left Channel Output	50L6GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	20	250	11B708	PRS250V20	BR2025	TC55	TD-20-250	TVA-1508	
C2A	40	300	11B742	AFH3-42		TCT3432		TVLS-2579 *	
B	30	300							
C	20	250							
C3	50	25	11B729	PRS25V50	BBR50-25	TC29	TD-50-25	TVA-1206	
C4	100	25NP	11B732	NP-PRS25V100		TCN425		TVAS-1207.1 *	
C5	100	25NP	11B732	NP-PRS25V100		TCN425		TVAS-1207.1 *	
C6	100	25NP	11B732	NP-PRS25V100		TCN425		TVAS-1207.1 *	
C7	4	25NP	①	NP-PRS50V4	BBR8-150 BBR8-150 †	TCN504		TVAS-1202.2 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use 7mfd (Part #11B741).
† Connect negative leads together.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

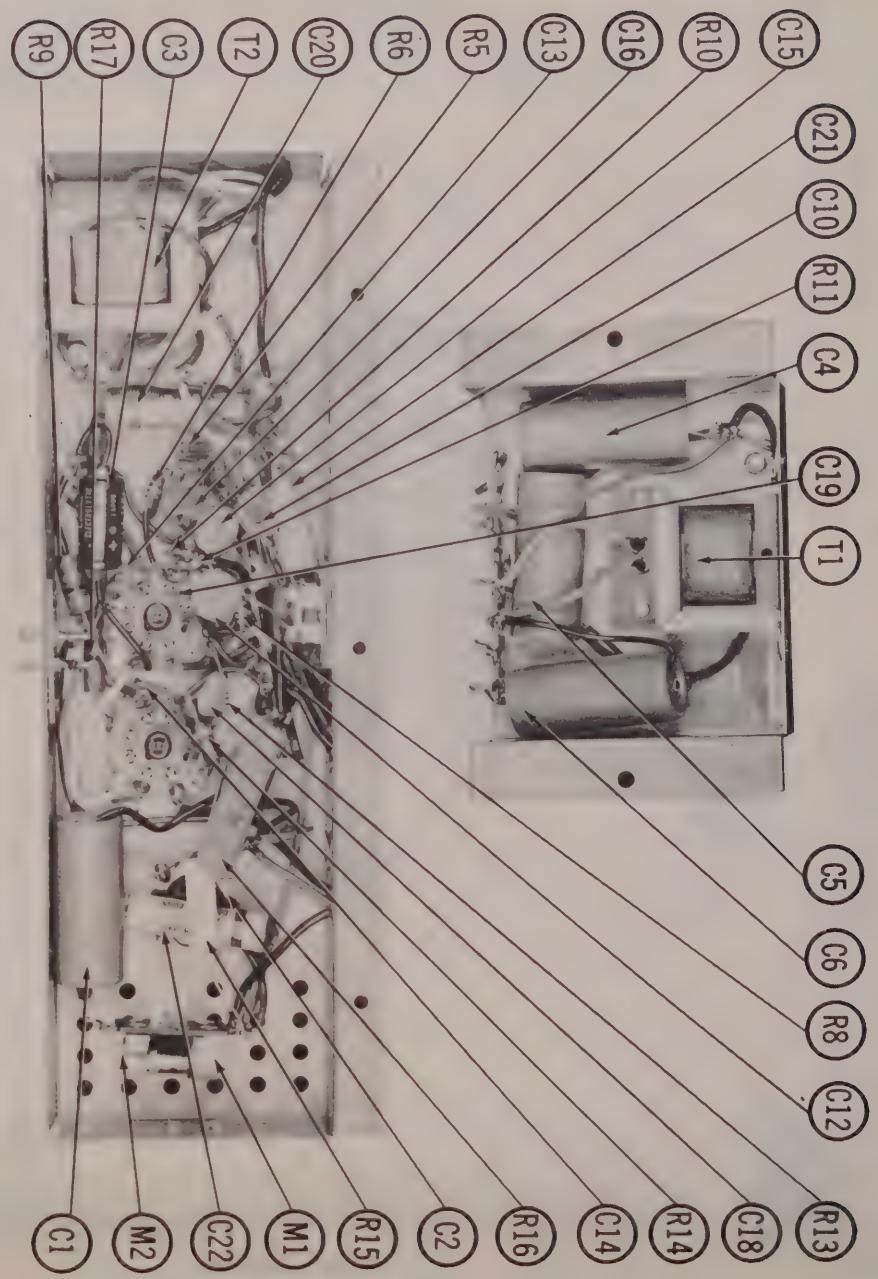
ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA COLUMBIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C8	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C9	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C10	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C12	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C13	2000				BPD-002	DD-202	BYA2D2	B-220	5HK-D2	
C14	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C15	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C16	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C17	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C18	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C19	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C20	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C21	.05	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C22	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3meg	1/2	9B604	B-85		Q13-140	†	Volume, Right Channel
B	3meg	1/2		SR-85		M13-140		Volume, Left Channel
R2A	500K	1/2	9B605	B-60	AD47-500K-S	Q13-133	■ UE1402	Treble, Right Channel
B	500K	1/2		SR-60	Not Req.	M13-133		Treble, Left Channel
C	Shaft			Not Req.	KSS-3	Not Req.		
R3A	3meg	1/2	9B604	B-85		Q13-140	†	Bass, Right Channel
B	3meg	1/2		SR-85		M13-140		Bass, Left Channel
R4A	200K	1/2	9B603	B-46	A47-200K-S	Q11-129	U43	Balance
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

† "STA-LOC" Equivalent: FA36A, RU36A, CS3500. ■ "STA-LOC" Equivalent: FA55A, RU55A, CS3500.

CHASSIS BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	COLUMBIA PART No.	NOTES
R5	6.8meg			
R6	270K			
R7	82K			
R8	470K			
R9	100Ω	2		
R10	6.8meg			
R11	270K			

ITEM No.	RATING OHMS	RATING WATT	COLUMBIA PART No.	NOTES
R12	82K			
R13	470K			
R14	10K	1		
R15	220Ω	5	16B429	
R16	47Ω	5	16B411	
R17	22Ω	1		Note 1

Note 1. Some versions may use 47Ω in this application.

CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L1		.4Ω	.003 Hy.	21B205						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	6000Ω CT	6-8Ω CT	3B239							
T2	2100Ω	1-2Ω	3B240							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA COLUMBIA PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	6"	PM	3-4Ω	1B108	6A21	
SP2	6"	PM	3-4Ω	1B108	6A21	
SP3	2" x 10"	PM	3-4Ω	1B120		

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA COLUMBIA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.085A	10B614 ①	HF154 ①	SD-94 ①	M150 ①		① Silicon Type
M2		10B614 ①	HF154 ①	SD-94 ①	M150 ①		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA COLUMBIA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M3		13-TB *				* Includes needle and mounting mechanism.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA COLUMBIA PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M4		† S69X or †♦ S69XSD or ♦ S69XDD	*† W-103STSS or *†♦ W-103STDS	* Includes Cartridge † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	COLUMBIA PART No.	NOTES
M5	Switch	19B626	Stereo-Monaural (DPDT, Slide Type)

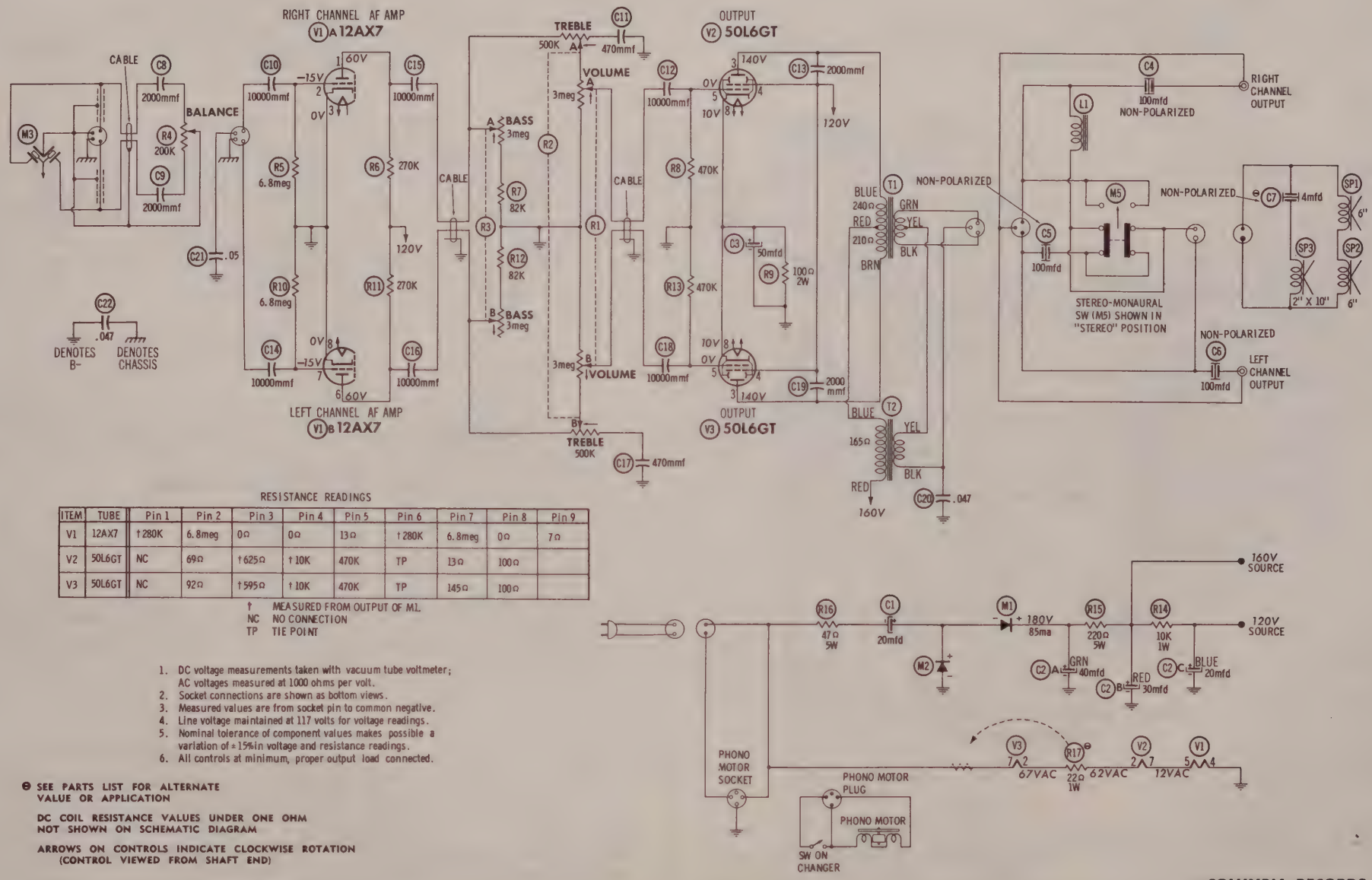
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	8B421	3 used, Silver
Knob	8B422	3 used, Gold
Knob	8B497	Balance, Black
Cabinet	17B813	Charcoal
Cabinet	17B814	Tan

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†280K	6.8meg	0Ω	0Ω	13Ω	†280K	6.8meg	0Ω	7Ω
V2	50L6GT	NC	69Ω	†625Ω	†10K	470K	TP	13Ω	100Ω	
V3	50L6GT	NC	92Ω	†595Ω	†10K	470K	TP	145Ω	100Ω	

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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COLUMBIA RECORDS
MODEL 626

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

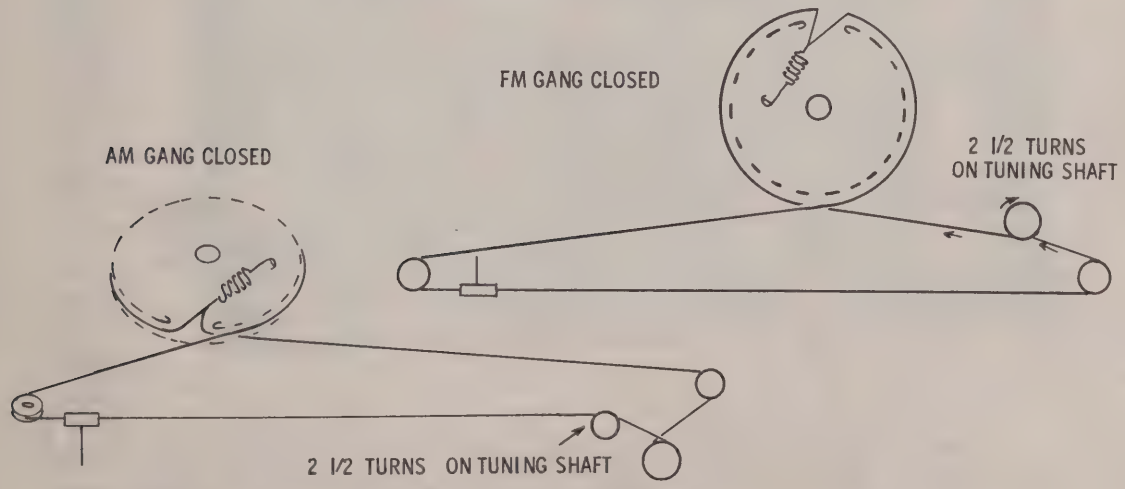
DEWALD MODEL M-1000

DEWALD MODEL M-1000

DEWALD MODEL M-1000

TRADE NAME	DeWald Model M-1000		
MANUFACTURER	DeWald Radio Mfg. Corp., 35-15 37th Ave., Long Island City 1, N.Y.		
TYPE SET	AC Operated 8 Tube FM-AM Tuner		
POWER SUPPLY	105-125 Volts AC, 60 Cycles	RATING	32 Watts, .33 Amp. ③ 117 Volts AC (FM)
TUNING RANGE-BROADCAST	540KC-1650KC	FREQ. MOD.	88-108MC

DIAL CORD STRINGING



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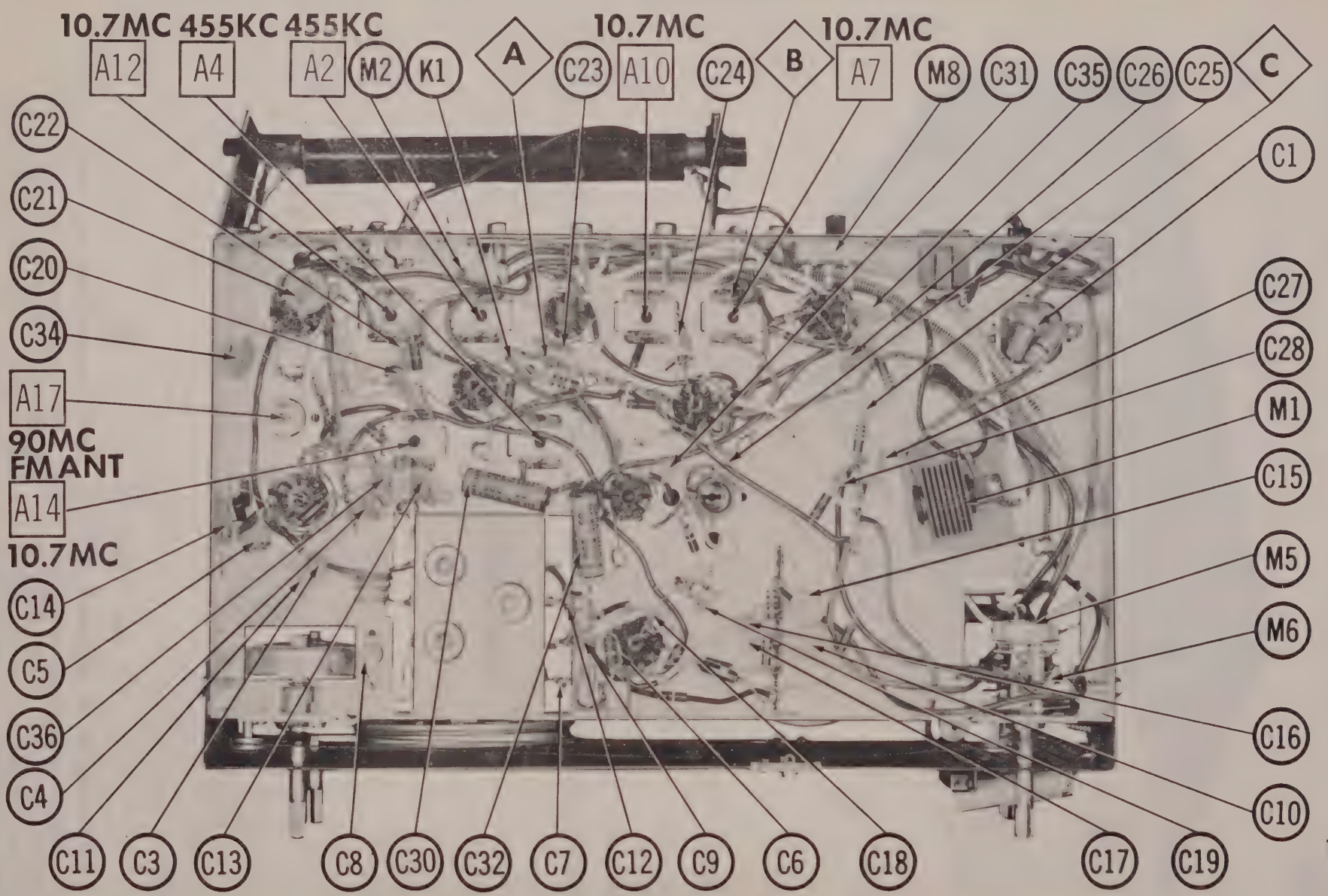
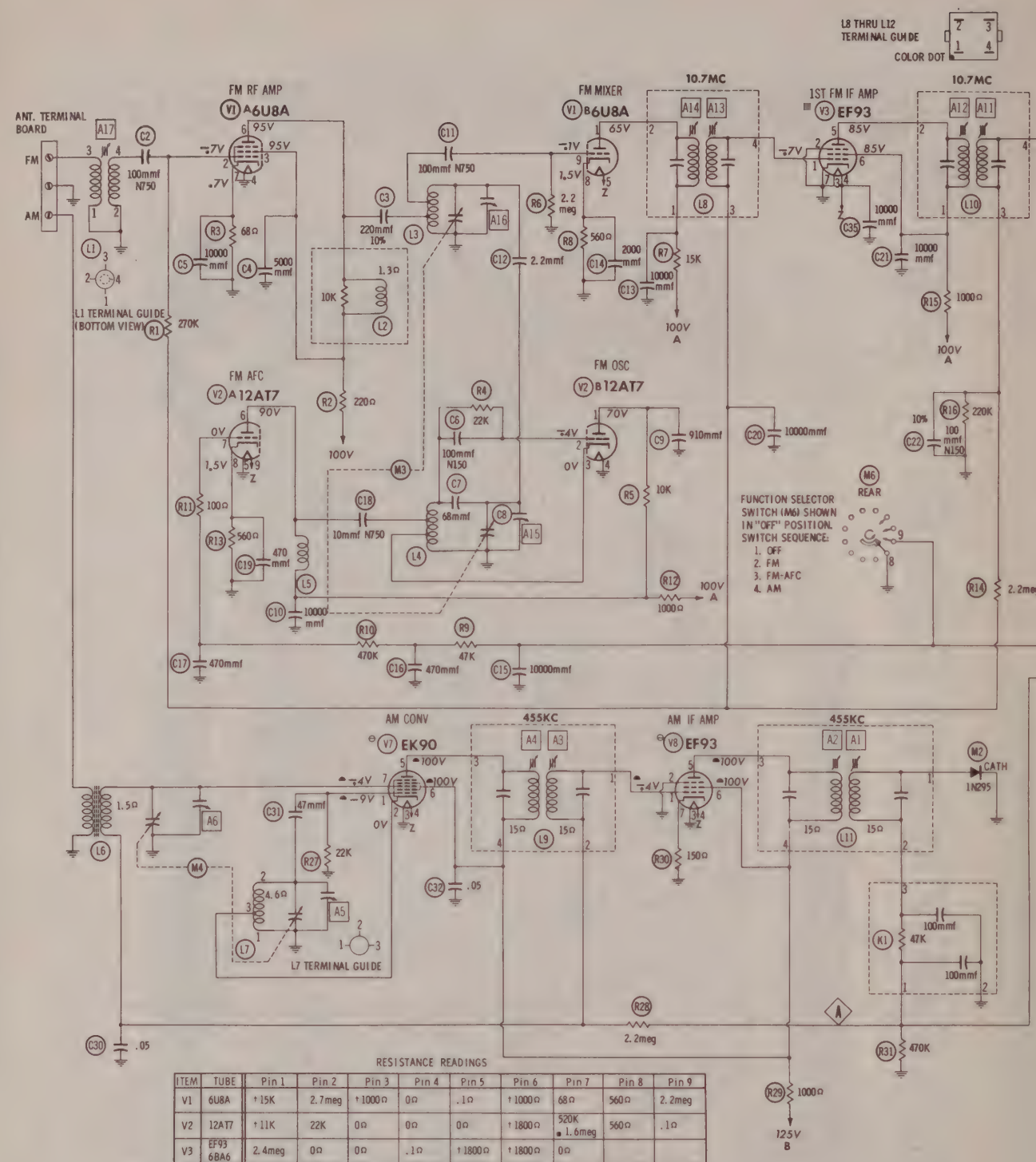
SET 452 FOLDER 7



CHASSIS BOTTOM VIEW - CAPACITOR, MISC. & ALIGNMENT IDENT.

CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

DEWALD
MODEL M-1000



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6U8A	†15K	2.7meg	†1000Ω	0Ω	.1Ω	†1000Ω	68Ω	560Ω	2.2meg
V2	12AT7	†11K	22K	0Ω	0Ω	0Ω	†1800Ω	520K ■ 1.6meg	560Ω	.1Ω
V3	EF93 6BA6	2.4meg	0Ω	0Ω	.1Ω	†1800Ω	†1800Ω	0Ω		
V4	EF94 6AU6	220K	0Ω	0Ω	.1Ω	†2200Ω	†2200Ω	0Ω		
V5	EF94 6AU6	100K	0Ω	0Ω	.1Ω	†11K	†11K	0Ω		
V6	6AL5	0Ω	100K	.1Ω	0Ω	200K	0Ω	100K		
V7	EK90 6BE6	▲22K	▲.1Ω	0Ω	.1Ω	†▲1800Ω	†▲1800Ω	▲2.2meg		
V8	EF93 6BA6	2.2meg	0Ω	0Ω	.1Ω	†1800Ω	†1800Ω	150Ω		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
▲ MEASURED IN "AM" POSITION.
† MEASURED FROM OUTPUT OF M1.
■ MEASURED IN "FM-AFC" POSITION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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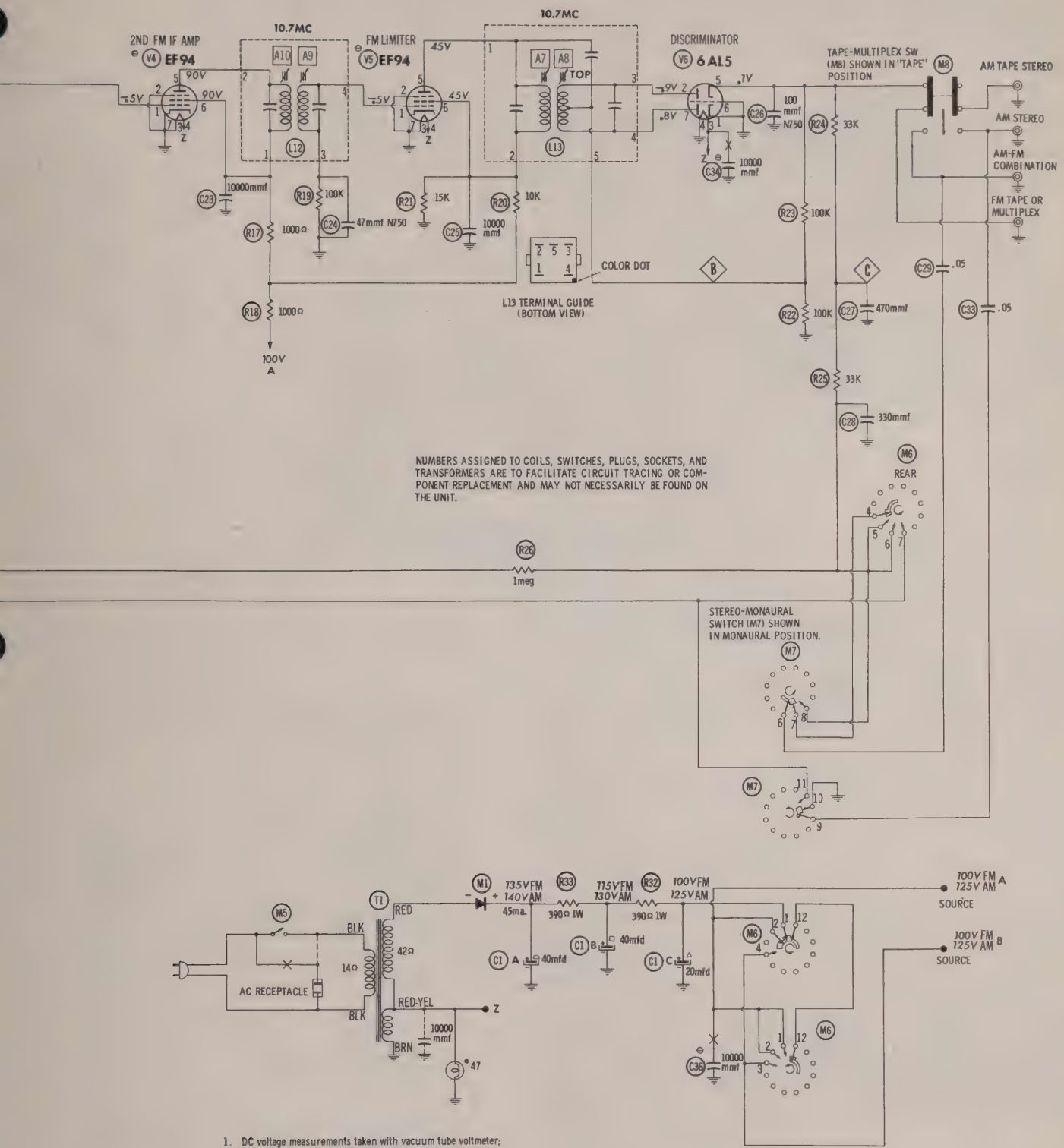


1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. No signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

DEWALD MODEL M-1000

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal general should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1, A2, A3, A4, A7 thru A14, A17.....GENERAL CEMENT #5097, 8727
WALSCO #2515

A5, A6, A16..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

A15..... GENERAL CEMENT #8721, 8722
WALSCO #2519

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of AM converter (V7). Low side to chassis.	455KC (400~ Mod.)	AM	Tuning gang fully open	DC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.		Loop	1600KC	"	1600KC	"	A5	"
3.		"	1400KC	"	Tune to 1400KC signal	"	A6	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR & VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	200mmf	High side to pin 1 (grid) of limiter(V5). Low side of chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe thru 1meg to point (B). Common to chassis.	A7	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point (C). Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
6.	"	High side to pin 9 (grid) of FM Mixer (V1B). Low side to chassis.	"	"	"	DC probe thru 1meg to point (B). Common to chassis.	A9, A10, A11, A12, A13, A14	Adjust for maximum deflection.

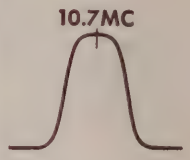


FIG. 1

FM IF ALIGNMENT USING FM SIGNAL GENERATOR & OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	200mmf	High side to pin 1 (grid) of Limiter. Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. amp. thru 1meg to point (B). Low side to chassis.	A7	Adjust for maximum gain and symmetry of response to Fig. 1 with markers as shown.
5.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A8	Adjust so that 10.7MC marker occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.
6.	"	High side to pin 9 (grid) of FM mixer (V1B). Low side to chassis.	"	"	"	DC probe thru 1meg to point (B). Low side to chassis.	A9, A10, A11, A12, A13, A14	Adjust for maximum gain and symmetry of response to Fig. 1 with markets as shown.

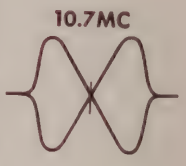


FIG. 2

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω Carbon Resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	108MC (Unmod.)	FM	108MC	DC probe thru 1meg to point (B). Common to chassis.	A15	Adjust for maximum deflection.
8.	"	"	106MC	"	106MC	"	A16	Adjust for maximum deflection while rocking tuning gang.
9.	"	"	90MC	"	90MC	"	A17	Adjust for maximum deflection.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Mixer	6U8A
V2	FM Osc. -FM AFC	12AT7
V3	1st FM IF Amplifier	EF93/6BA6
V4	2nd FM IF Amplifier	EF94/6AU6

ITEM No.	USE	TYPE
V5	FM Limiter	EF94/6AU6
V6	Discriminator	6AL5
V7	AM Converter	EK90/6BE6
V8	AM IF Amplifier	EF93/6BA6

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DEWALD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▬40	200	E-212-4	AFH4-02	D0020	FP318.74	TMQ-3	TVL-4536	
B	■40	200							
C	▲20	200							

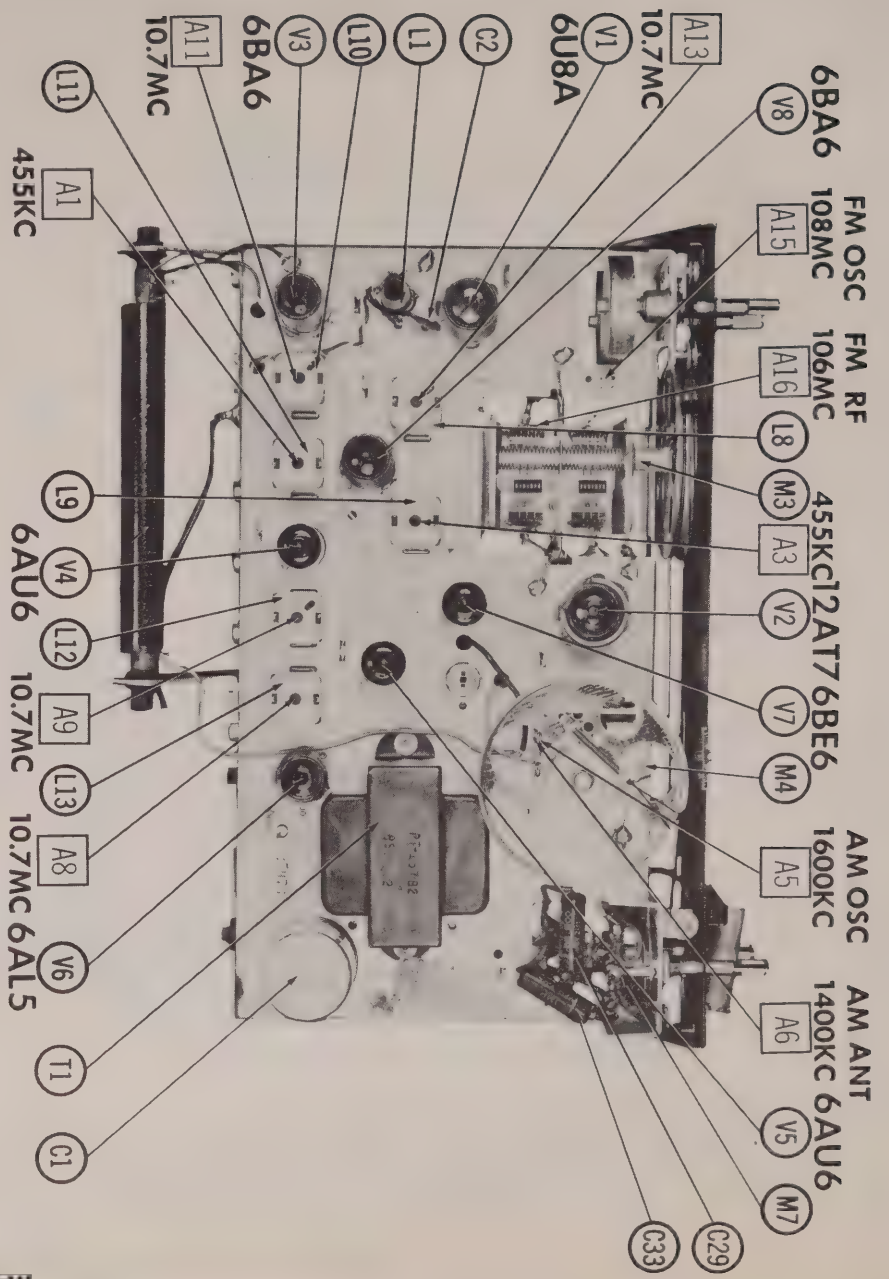
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	DEWALD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	100		N750		N750-DI 100	DTN-100	C10T1U	CN7-310	5TCU-T1	
C3	220		10%		DI-220	D6-220	L10T22	ZTL-322	5GA-T22S 10%*	
C4	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C5	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C6	100		N150							
C7	68				SI 68	D6-680	L10Q68	CNO-468	5GA-Q68	
C8				TC-223-1						
C9	910				DI-1000	DD-102	L10T91	B-210	5GA-D1	
C10	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	100		N750		N750-DI 100	DTN-100	C10T1U	CN7-310	5TCU-T1	
C12	2.2					TCZ2R2	C10V22C	CNO-522	5TCCB-V22	
C13	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C14	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C15	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C16	470				BPD-0047	DD-471	BYA10T47	B-347	5GA-T47	
C17	470				BPD-0047	DD-471	BYA10T47	B-347	5GA-T47	
C18	10		N750		N750-DI 10	DTN-10	C10Q1U	CN7-410	5TCU-Q1	
C19	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C20	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C21	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C22	100		N150 10%							
C23	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C24	47		N750		N750-DI 47	DTN-47	C10Q47U	CN7-447	5TCU-Q47	
C25	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C26	100		N750		N750-DI 100	DTN-100	C10T1U	CN7-310	5TCU-T1	
C27	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C28	330				BPD-00033	DD-331	L10T33	B-330	5GA-T33	
C29	.05	200			P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C30	.05	200			P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C31	47		N750		N750-DI 47	DTN-47	C10Q47U	CN7-447	5TCU-Q47	
C32	.05	200			P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C33	.05	200			P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C34	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	①
C35	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C36	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	①

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	DEWALD PART No.	NOTES
R1	270K			
R2	220Ω			
R3	68Ω			
R4	22K			
R5	10K			
R6	2.2meg			
R7	15K			
R8	560Ω			
R9	47K			
R10	470K			
R11	100Ω			
R12	1000Ω			
R13	560Ω			
R14	2.2meg			
R15	1000Ω			
R16	220K			
R17	1000Ω			
R18	1000Ω			
R19	100K			
R20	10K			
R21	15K			
R22	100K			
R23	100K			
R24	33K			
R25	33K			
R26	1meg			
R27	22K			
R28	2.2meg			
R29	1000Ω			
R30	150Ω			
R31	470K			
R32	390Ω	1		
R33	390Ω	1		

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	DEWALD PART No.	REPLACEMENT DATA	
K1	AM RF Filter	100mmf, 100mmf, 47K		Aerovox	PA-97
				Centralab	PC-50
				Cornell-Dubilier	111TM1
				Sprague	D-1

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: DEWALD PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil	1102-3						
L2	RF Choke	1104-4			SW-631 *			4.7uh †
L3	FM RF Coil	1100-3						
L4	FM Osc. Coil	0-156-3						
L5	RF Choke	1104-3	19-1002	19-1002	SW-630	4606		2.7uh
L6	Loopstick	L-155B-7						
L7	AM Osc. Coil	1101C-5						
L8	1st FM IF Trans.	1038B-5	16-3487	16-3487	FM-254	1463		
L9	1st AM IF Trans.	I-110	16-6758	16-6758	BC-352	12-C1		
L10	2nd FM IF Trans.	1038B-5	16-3487	16-3487	FM-254	1463		
L11	2nd AM IF Trans.	I-110	16-6758	16-6758	BC-353	12-C2		
L12	3rd FM IF Trans.	1038B-5	16-3487	16-3487	FM-254	1463		
L13	Discriminator	1038B-2	17-3494	17-3494	FM-253	1464		

* Parallel with 10K Resistor
† Wound On 10K

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	REPLACEMENT DATA: DEWALD PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .33A	115V @ .042A Tap @ 6.3V @ 2.7A	PT-157B-2						

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA: DEWALD PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.045A	R-837-2①	1235AH①	RS100 ①	Model 100①		① Selenium

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: DEWALD PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M2	1N295		1N60	1N295	AM Detector (Pigtail Leads)

MISCELLANEOUS

ITEM No.	PART NAME	DEWALD PART No.	NOTES
M3	Tuning Cap.	V222B-3	FM, 2 Gang
M4	Tuning Cap.	V217-5	AM, 2 Gang (Ant. 14-270mmf, Osc. 19-128mmf)
M5	Switch		Power Off-On
M6	Switch	8089-3	Function Selector (Rotary Wafer Type)
M7	Switch	BS-836-2	Stereo-Monaural (Rotary Wafer Type)
M8	Switch		(DPDT, Slide Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	K-472-7	Tuning
Knob	K-472-6	Selector
Dial Scale	D6-604-3	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

EXCEL MODEL T-211

EXCEL MODEL T-211

EXCEL MODEL T-211

TRADE NAME	Excel Model T-211
IMPORTER	Excel Corp. of America, 9 Rockefeller Plaza, New York 20, N. Y.
TYPE SET	Battery Operated 4 Tube Portable AM Receiver
POWER SUPPLY	1.5 Volts DC "A" Supply & 67.5 Volts DC "B" Supply
RATING	120MA@1.5 Volts DC & 13.2 MA @67.5 Volts DC
TUNING RANGE—BROADCAST	540KC—1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1 thru A4.....GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9293, 5003
WALSCO #2516, 2519
A5 & A6.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A7.....GENERAL CEMENT #8721, 8722
WALSCO #2519

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400∿ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1600KC	"	"	A5	"
3.		"	600KC	600KC	"	A6	"
4.		"	1400KC	1400KC	"	A7	"

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SET 452 FOLDER 8

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Converter	1AQ5/1R5-SF
V2	IF Amplifier	1AM4/1T4-SF
V3	Det.-AVC-AF Amp.	1AS5/1U5-SF
V4	Output	3S4-SF

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	EXCEL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	10	80		SRE150V10	NLW10-100	TT150X8		TE-1407	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	EXCEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	100				SI 100	D6-101	L10T1	UC-531	5GA-T1	
C3	.01	200			P285N-01	DD-103	BYA10S1	GEM-411	65P10352	
C4	.01	200			P288N-01	DD-103	BYA10S1	GEM-411	65P10352	
C5	100				SI 100	D6-101	L10T1	UC-531	5GA-T1	
C6	.002	200			P285N-002	DD-103	BYB6D2	GEM-6222	65P20253	
C7A	100				BPD-0001	DD-101	BY0T1	B-310	5GA-T1	
B	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C	100				BPD-0001	DD-101	L10T1	B-310	5GA-T1	
D	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
E	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EXCEL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1meg	½						Volume & Switch

RESISTORS

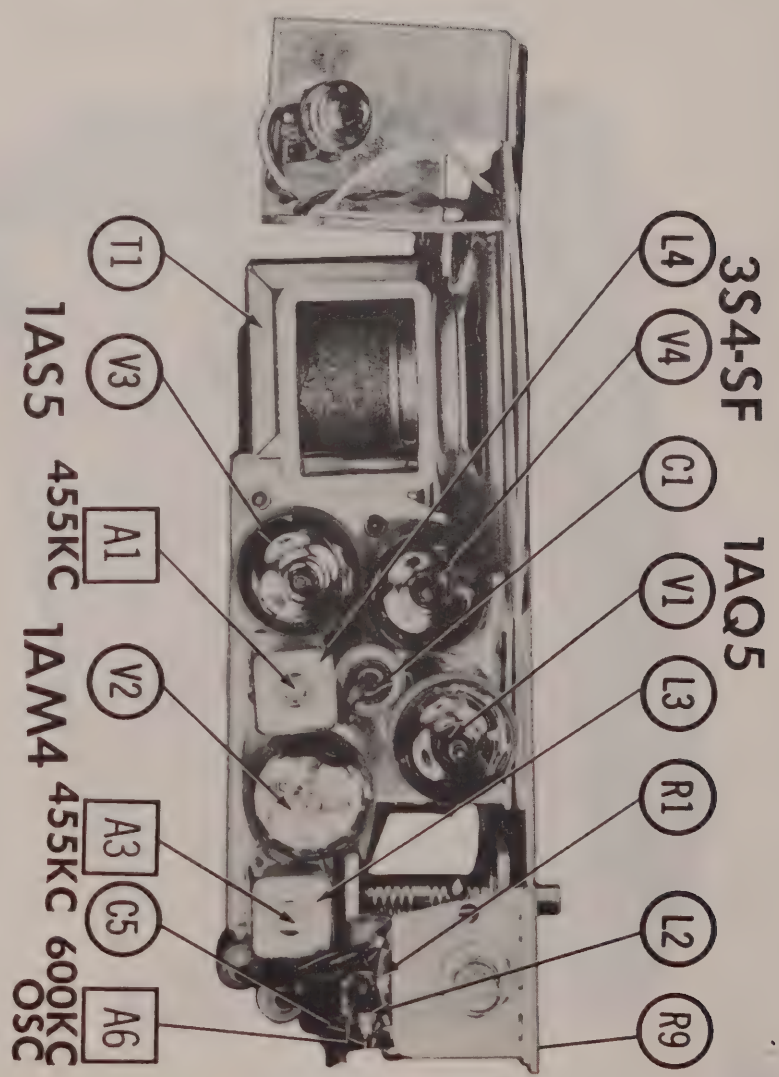
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		EXCEL PART No.	NOTES
	OHMS	WATT		
R2	100K			Note 1
R3	8200Ω			
R4	3.3meg			
R5	10meg			

ITEM No.	RATING		EXCEL PART No.	NOTES
	OHMS	WATT		
R6	1meg			Note 2
R7	3.9meg			
R8	3.3meg			
R9	5600Ω			

Note 1. Some versions may use 10K in this application.
Note 2. Some versions may use 4.7meg in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		EXCEL PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1 L2 L3 L4	Loopstick Osc. Coil Input IF Output IF							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	EXCEL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	10K	13Ω								

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	EXCEL PART No.	QUAM PART No.	
SP1	2½"	PM	13Ω		25A07Z13	

BATTERIES

ITEM No.	VOLTAGE	EXCEL PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1 M2	1.5V 67.5V		2R	UX45	A100	416	M-13R	M-217	

MISCELLANEOUS

ITEM No.	PART NAME	EXCEL PART No.	NOTES
M3	Tuning Cap.		2 Gang

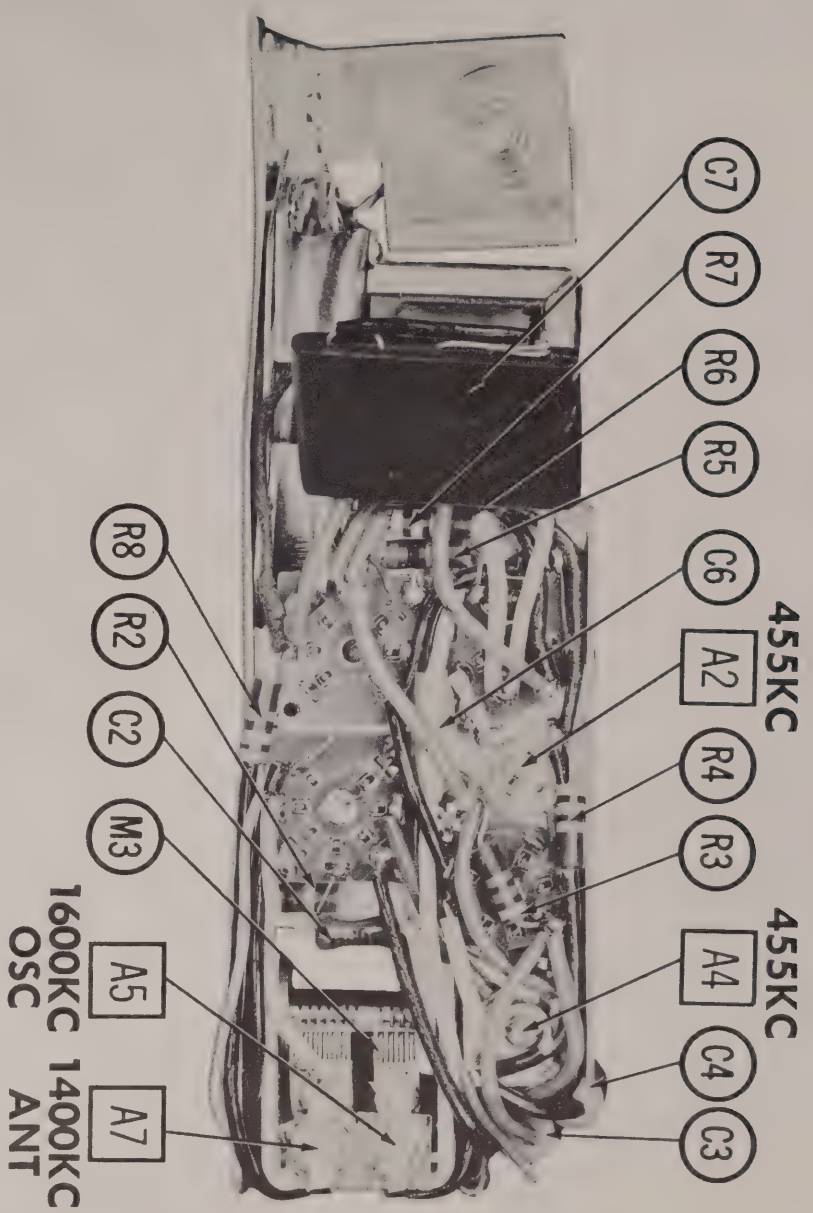
CABINETS & CABINET PARTS

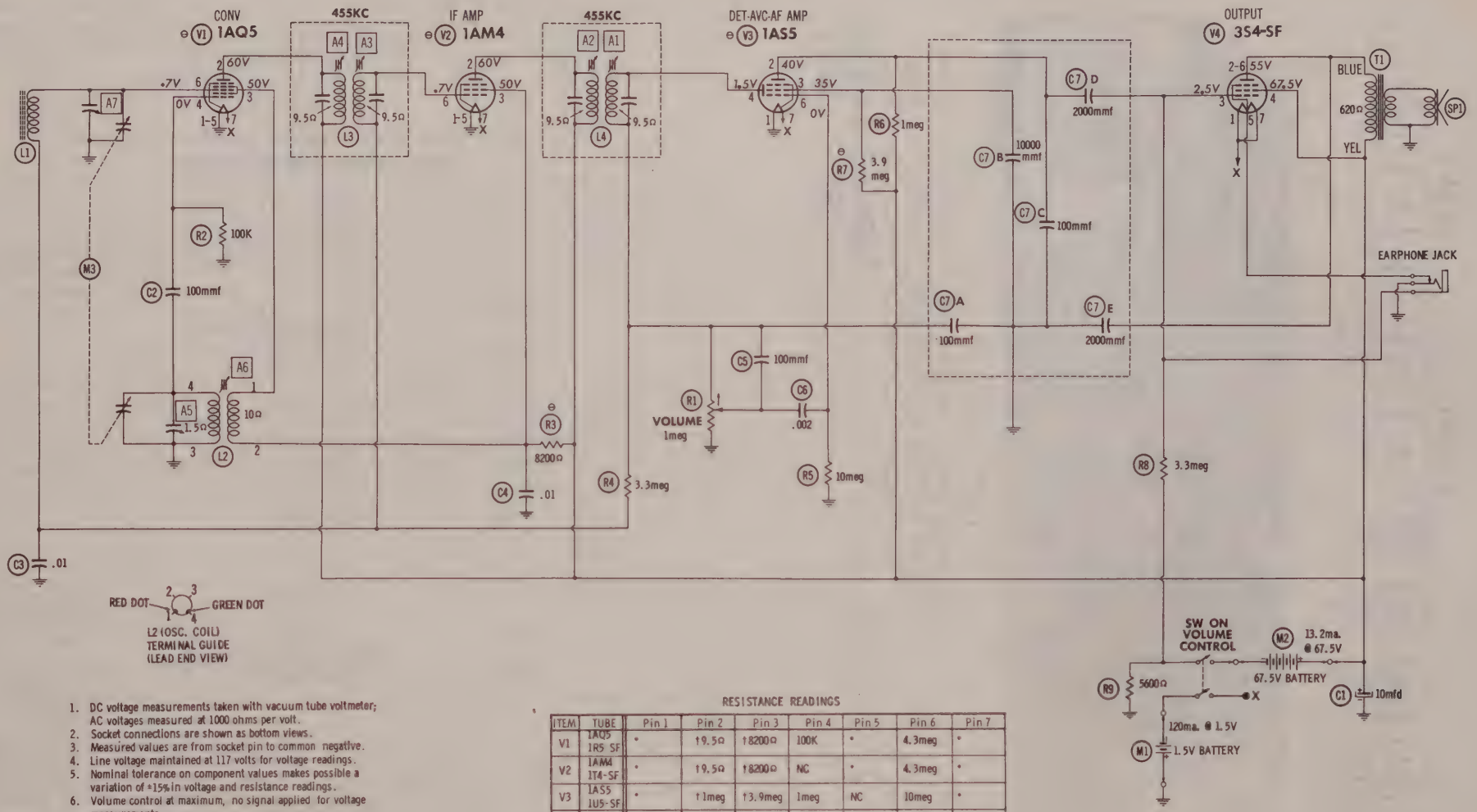
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)

CHASSIS BOTTOM VIEW





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1AQ5 1R5 SF	*	†9.5Ω	†8200Ω	100K	*	4.3meg	*
V2	1AM4 1T4-SF	*	†9.5Ω	†8200Ω	NC	*	4.3meg	*
V3	1AS5 1U5-SF	*	†1meg	†3.9meg	1meg	NC	10meg	*
V4	3S4-SF	*	†620Ω	3.3meg	†0Ω	*	†620Ω	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM JUNCTION OF C1 AND T1.
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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EXCEL MODEL T-211

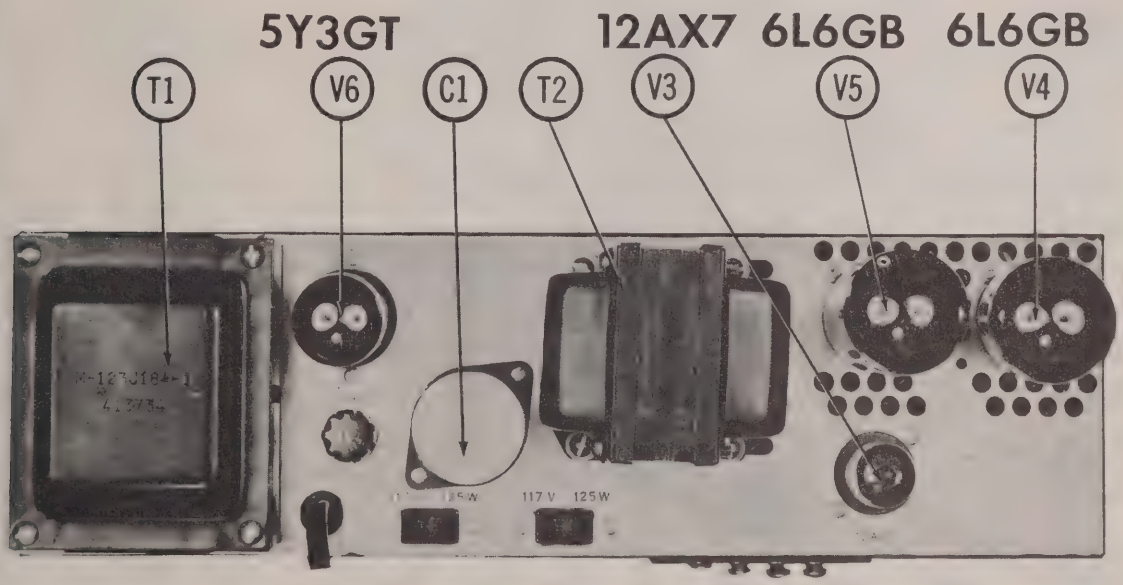
PHOTOFACT* Folder

GENERAL ELECTRIC MODEL PA-20

GENERAL ELECTRIC
MODEL PA-20

GENERAL ELECTRIC
MODEL PA-20

TRADE NAME	General Electric Model PA-20
MANUFACTURER	General Electric Co., Specialty Electronic Components Dept., West Genesee St., Auburn, N.Y.
TYPE SET	AC Operated 6 Tube Audio Amplifier With Preamplifier
POWER SUPPLY	105-125 Volts AC, 60 Cycle RATING 120 Watts, 1.08 Amp. @ 117 Volts AC



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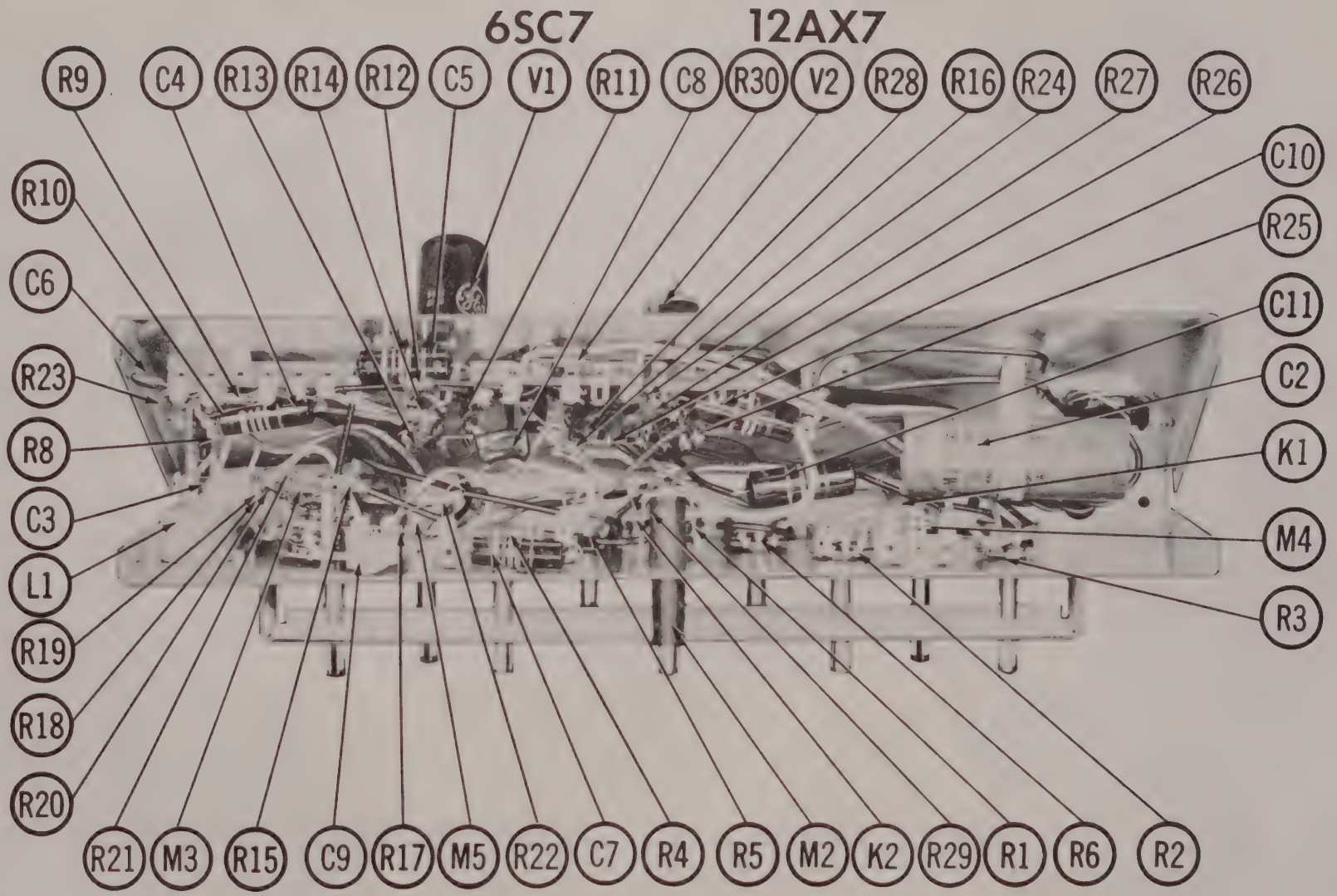
SET 452 FOLDER 9



PREAMP CHASSIS-BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Phono Preamplifier	6SC7	
V2	AF Amplifier	12AX7	
V3	AF Amp. -Phase Inv.	12AX7	
V4	Output	6L6GB	
V5	Output	6L6GB	
V6	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	General Electric PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▲40	450	ECE-233	AFH4-87	D0660	FP431.7	TMQ-100	TVL-4747	
B	■40	450							
C	▲5	350							
D	100	50							
C2A	30	350	ECE-232	PRS450V3030	BBRD3345	TCD77	TDLD-29	TVA-2735	
B	30	350							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	2.0	50		ECC-138						
C4	.047	200			P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47	
C5	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C6	1100		5%	ECG-017			1R5D11		MS-211	
C7	.047	200			P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47	
C8	750		5%	ECU-313			1R5T75		MS-375	
C9	10000			ECW-3186	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C10	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C11	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C12	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C13	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C14	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	

CONTROLS

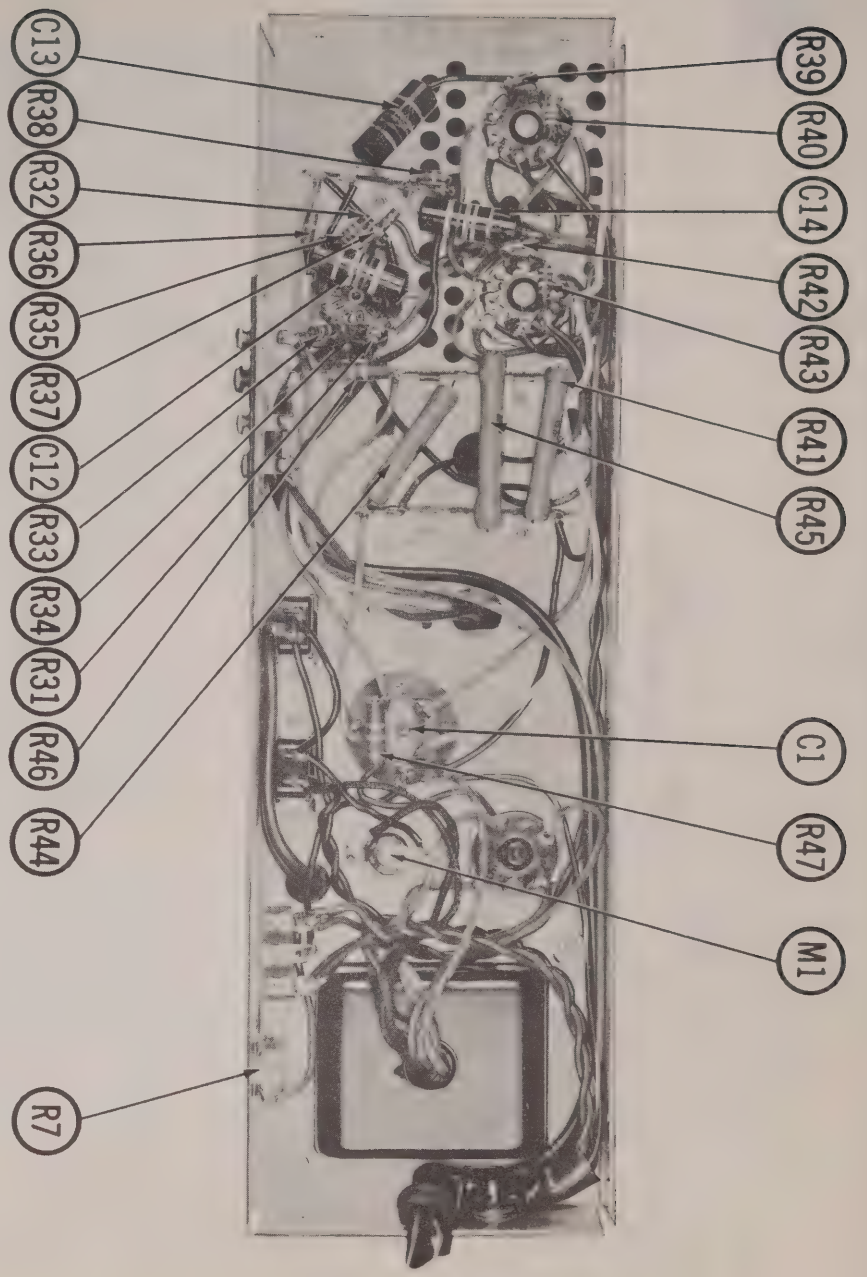
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	General Electric PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	500K	½	ERC-358	BT-160		Q18-133XX	UDT-283	Loudness, Taps @ 120K, 350K
R2A	1meg	½	ERC-355	B-69	A47-1meg-S	Q11-137	U54	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K	½	ERC-359	B-59	A47-500K-S	Q11-133	U50	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4A	1meg	½	ERC-354	B-70	A47-1meg-Z	Q13-137	U53	Level
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R5A	500K	½	ERC-357	B-60	A47-500K-Z	Q13-133	U48	Radio
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R6A	500K	½	ERC-357	B-60	A47-500K-Z	Q13-133	U48	Aux. 1
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R7A	100Ω	2(WW)	ERC-231	WN-101	A43-100	W11-084	C100R	Hum Balance
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		General Electric PART No.	NOTES
	OHMS	WATT		
R8	120K			
R9	510Ω 5%			
R10	100K 5%			
R11	3.3meg			
R12	270K			
R13	3.3meg			
R14	470K			
R15	470K			

AMP CHASSIS BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	General Electric PART No.	NOTES
R16	270K			
R17	10meg			
R18	62K 5%			
R19	24K 5%			
R20	20K 5%			
R21	24K 5%			
R22	2.7meg 5%			
R23	10meg			
R24	24K 5%			
R25	680Ω			
R26	470K			
R27	220K			
R28	1800Ω			
R29	10K			Note 1
R30	120K			
R31	470K			
R32	220K			
R33	27K 5%			
R34	3000Ω 5%			
R35	470K			
R36	110K 5%			
R37	3000Ω 5%			
R38	110K 5%			
R39	1000Ω			
R40	470K			
R41	250Ω	5		
R42	1000Ω			
R43	470K			
R44	7500Ω	5		
R45	25K	7		
R46	22K	1		
R47	22K	1		

Note 1. Not used in some versions.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	General Electric PART No.	REPLACEMENT DATA	
K1	Tone Compensation	100mmf, 4700mmf, 4700mmf, 1000Ω, 100K, 100K, 470K	EEK-008	Centralab Sprague	PC-190 TCS-16
K2	Loudness Compensation	100mmf, 200mmf, 4500mmf, 4500mmf, 50K, 50K	EEK-009	Centralab Sprague	PC-324 TC-4

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA General Electric PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Rumble Filter Choke	ELX-049						2.25Hy.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RATING SEC. 4	RATING SEC. 5	General Electric PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ 1.08A	800VCT ⓐ .120A	5V ⓐ 2A	6.3V ⓐ 3A			ETP-332						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	General Electric PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7200Ω CT	16Ω taps ⓐ 8Ω, 4Ω	ETO-185	22S68 ①	A-3128		A-3307	22S68 ①	S-60A	① Drill new mounting holes.

FUSES

ITEM No.	TYPE	RATING	General Electric PART No. FUSE	General Electric PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	5A 250V		EJW-004	312005. (3AG 5A 250V)	342012	MTH5	HKP

MISCELLANEOUS

ITEM No.	PART NAME	General Electric PART No.	NOTES
M2	Lamp		#47
M3	Switch	ESW-114	Selector (8 Position, Rotary Wafer Type)
M4	Switch	ESO-001	Power On-Off (SPST, Rotary Snap Type)
M5	Switch	ESO-001	Rumble Filter (SPST, Rotary Snap Type)

CABINETS & CABINET PARTS

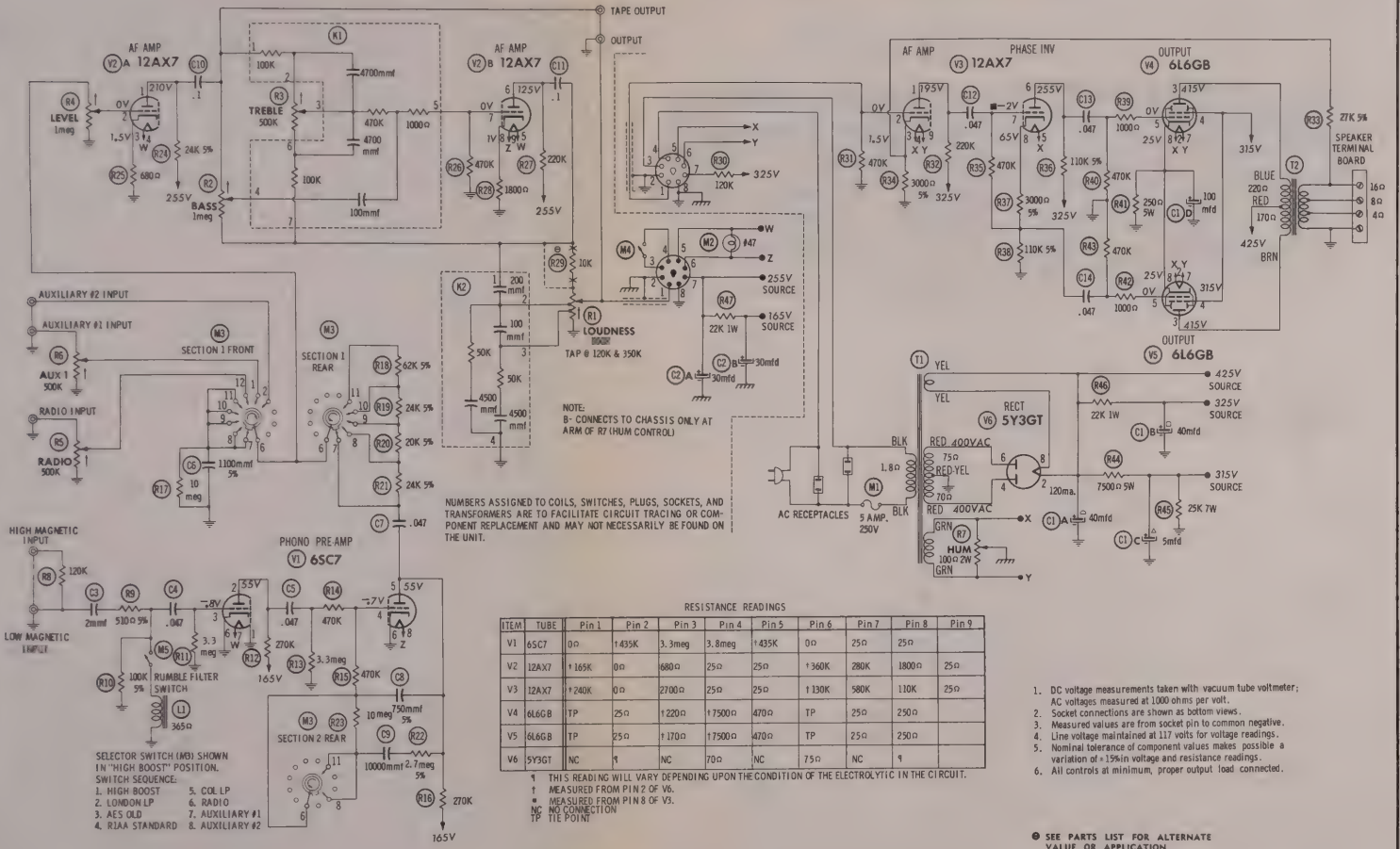
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	EDK-547	Large, Black with Blue Line, 5 Used
Knob	EDK-546	Small, Black with Dot, 2 Used
Cabinet	EAV-1006	
Panel	EDE-168	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6SC7	0Ω	†435K	3.3meg	3.8meg	†435K	0Ω	25Ω	25Ω	
V2	12AX7	†165K	0Ω	680Ω	25Ω	25Ω	†360K	280K	1800Ω	25Ω
V3	12AX7	†240K	0Ω	2700Ω	25Ω	25Ω	†130K	580K	110K	25Ω
V4	6L6GB	TP	25Ω	†220Ω	†7500Ω	470Ω	TP	25Ω	250Ω	
V5	6L6GB	TP	25Ω	†170Ω	†7500Ω	470Ω	TP	25Ω	250Ω	
V6	5Y3GT	NC	¶	NC	70Ω	NC	75Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V6.
* MEASURED FROM PIN 8 OF V3.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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GENERAL ELECTRIC MODEL PA-20

PHOTOFACT* Folder

LAFAYETTE
MODEL PA-63

LAFAYETTE
MODEL PA-63

TRADE NAME	Layafette Model PA-63		
SUPPLIER	Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.		
TYPE SET	AC Operated 8 Tube, 4 Channel Audio Amplifier With Manual Record Player		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	130 Watts, 1.1 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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H970R

SET 452 FOLDER 10

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	7025	①
V2	AF Amplifier	12AX7	
V3	AF Amp. - Phase Inv.	12AX7	
V4	Output	EL34/6CA7	

ITEM No.	USE	TYPE	NOTES
V5	Output	EL34/6CA7	
V6	Voltage Regulator	6973	
V7	Rectifier	5U4GB	
V8	Rectifier	5U4GB	

① Some versions may use 12AX7 in this application.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	LAFAYETTE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▰40	500		AFH3-52	C0390			TVLS-3963 *	
B	■20	500			BR1250				
C	▲20	500							
C2A	■10	350		AFH2-47	B0370	FP231	TMD-47	TVL-2750	
B	▲10	350							
C3A	■10	250		AFHS3-107-50	A0430	FP384.16	TMS-49	TVLS-2500 *	
B	▲100	15			BBR100-15		TD-100-15		
C4	50	50		PRS50V50	BR505	TC39	TD-50-50	TVA-1308	
C5	50	50		PRS50V50	BR505	TC39	TD-50-50	TVA-1308	

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

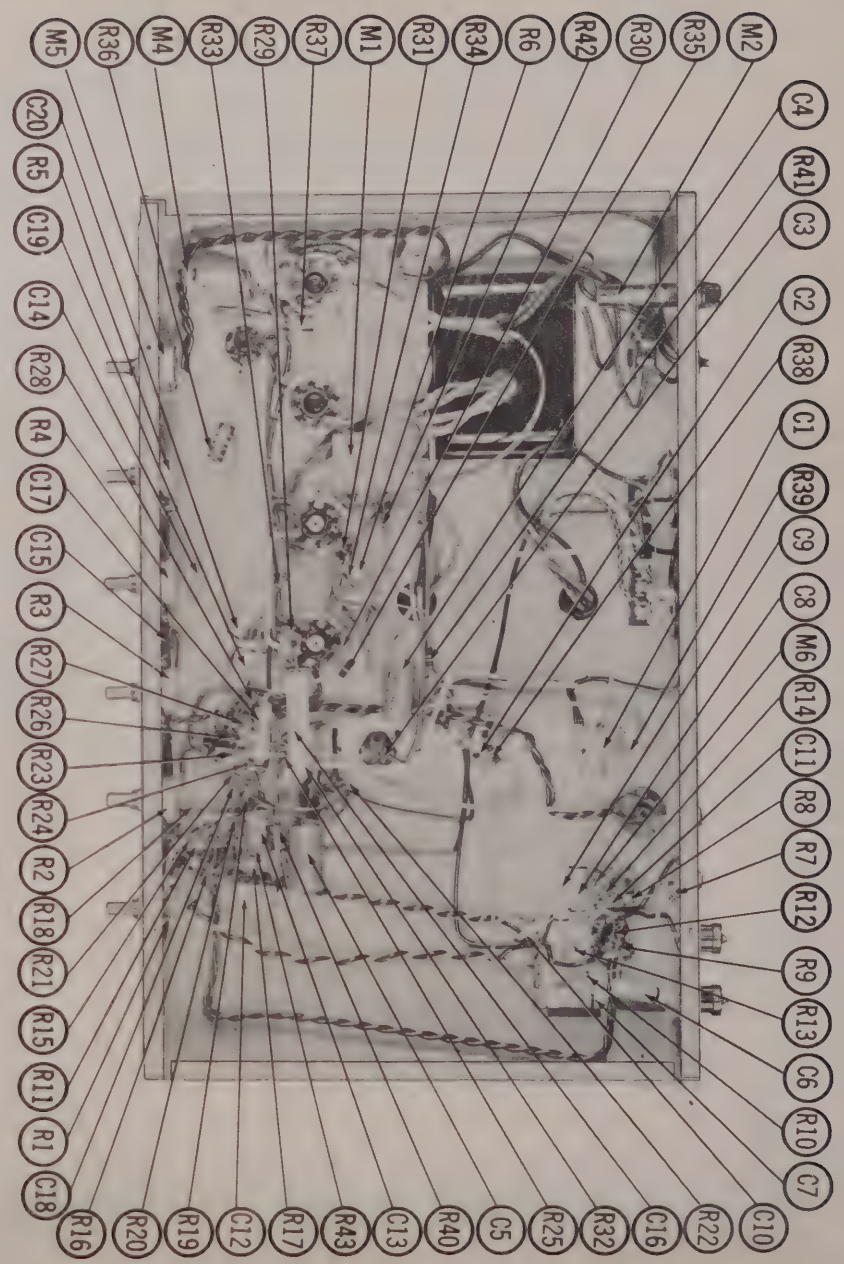
ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	LAFAYETTE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C7	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C8	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C9	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C10	3000		10%		DI-3000				5HK-D3S 10% *	
C11	800		10%		DI-800				5GA-T8S 10% *	
C12	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C13	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C14	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C15	470		10%		DI-470	MD-471		JL-347	5GA-T47S 10% *	
C16	250		10%		DI-250	MD-251	L10T25		5GA-T25S 10% *	
C17	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C18	1000		10%		DI-1000			JL-210	5HK-D1S 10% *	
C19	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C20	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	LAFAYETTE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	GVC-500K	B-60	A47-500K-Z	QI3-133	U48	Mic. 1
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R2A	500K	½	GVC-500K	B-60	A47-500K-Z	QI3-133	U48	Mic. 2, Mag. Phono
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R3A	500K	½	GVC-500K	B-60	A47-500K-Z	QI3-133	U48	Phono
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R4A	2meg	½	LFBC2M	B-76	A47-2meg-Z	QI3-139	U55	Bass
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R5A	500K	½	GVC-500K	B-60	A47-500K-Z	QI3-133	U48	Treble
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R6A	10K	½	CLU-10K	B-14	A47-10K-S	QI1-116	U20	Bias
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	

CHASSIS-BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	LAFAYETTE PART No.	NOTES
R7	47K			
R8	10K			
R9	3.3meg			
R10	100K			
R11	470K			
R12	3.3meg			
R13	100K			
R14	100K			
R15	470K			
R16	1meg			
R17	100K			
R18	470K			
R19	10meg			
R20	1000Ω			
R21	100K			
R22	220K			
R23	10K			
R24	100K			
R25	100Ω			
R26	100K			
R27	100K			
R28	1000Ω			
R29	220K			
R30	120K			Note 1
R31	1000Ω			
R32	10Ω	10		
R33	270K			
R34	120K			Note 1
R35	1000Ω			
R36	220K	2		
R37	100K	2		
R38	22K			
R39	10K			
R40	10K			
R41	22K			
R42	18K			
R43	1000Ω			

Note 1. Some versions may use 100K in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA LAFAYETTE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.1A SEC. 3 6.3VCT @ 4.5A	800VCT @ .100A Tap @ 105V @ .001A	5V @ 6A	TP75L						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA LAFAYETTE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4000Ω CT	250Ω Tap @ 84Ω (70V), 16Ω, 8Ω	TO75B							

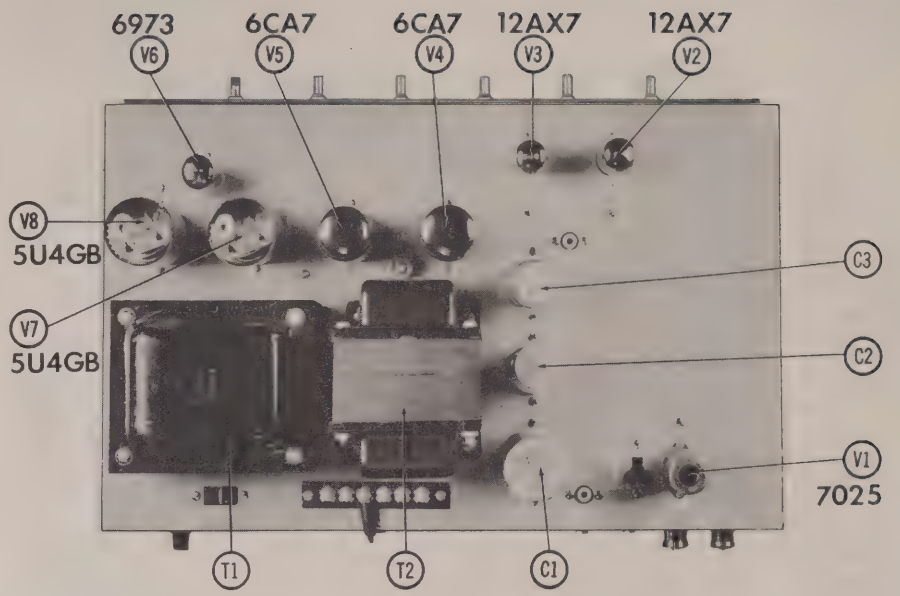
SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA LAFAYETTE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.001A		1159	D-5410	10	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA LAFAYETTE PART No. FUSE	LAFAYETTE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	5A 250V			312005. (3AG 5A 250V)	342001	MTH5	HKP

CHASSIS-TOP VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA LAFAYETTE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M3		* 81-T † B81-T				* Includes needles. † Tone arm complete with cartridge.

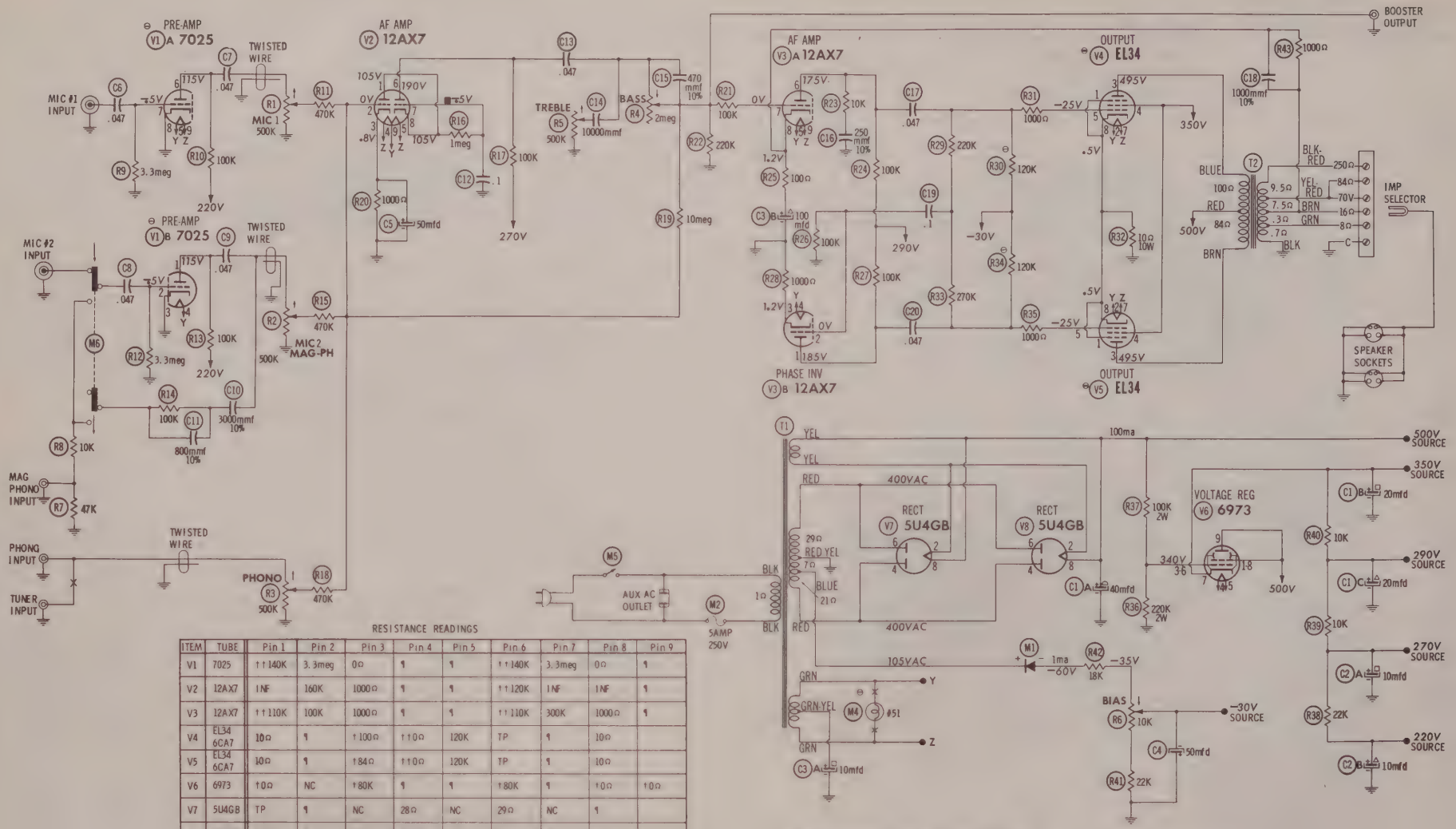
MISCELLANEOUS

ITEM No.	PART NAME	LAFAYETTE PART No.	NOTES
M4	Lamp		#51 (Not used in some versions.)
M5	Switch		Power On-Off (SPST, Rotary Snap Type)
M6	Switch		Magnetic Pickup-Mic. 2 (DPDT, Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025	††140K	3.3meg	0Ω	¶	¶	††140K	3.3meg	0Ω	¶
V2	12AX7	INF	160K	1000Ω	¶	¶	††120K	INF	INF	¶
V3	12AX7	††110K	100K	1000Ω	¶	¶	††110K	300K	1000Ω	¶
V4	EL34 6CA7	10Ω	¶	†100Ω	††0Ω	120K	TP	¶	10Ω	
V5	EL34 6CA7	10Ω	¶	†84Ω	††0Ω	120K	TP	¶	10Ω	
V6	6973	†0Ω	NC	†80K	¶	¶	†80K	¶	†0Ω	†0Ω
V7	5U4GB	TP	¶	NC	28Ω	NC	29Ω	NC	¶	
V8	5U4GB	NC	¶	NC	28Ω	NC	29Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V8.
†† MEASURED FROM PIN 7 OF V6.
▪ MEASURED FROM PIN 8 OF V2.
NC NO CONNECTION
TP TIE POINT

Ⓔ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

BIAS ADJUSTMENT (R6)

Connect a DC VTVM from center terminal of R6 to chassis. Adjust R6 for -30 Volts DC.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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LAFAYETTE MODEL PA-63

PHOTOFACT* Folder with CIRCUITRACE*

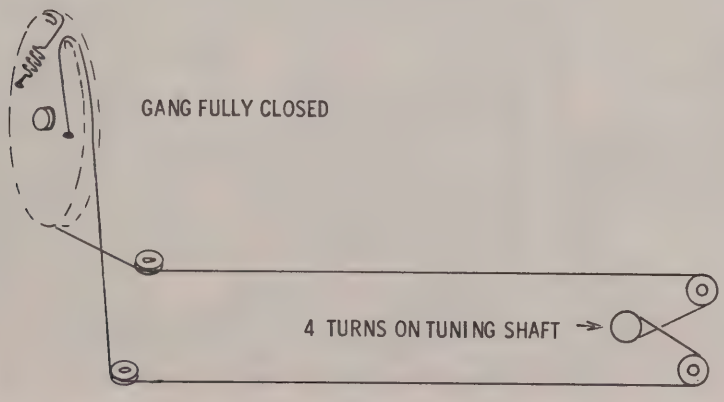
MAGNAVOX CHASSIS 54-03-00, 54-03-10, 54-03-21, 54-04-00, 54-04-10, 54-04-21

MAGNAVOX CHASSIS 54-03-00, 54-03-10, 54-03-21, 54-04-00, 54-04-10, 54-04-21

MAGNAVOX CHASSIS 54-03-00, 54-03-10, 54-03-21, 54-04-00, 54-04-10, 54-04-21

TRADE NAME	Magnavox Chassis 54-03-00, 54-03-10, 54-03-21, 54-04-00, 54-04-10, 54-04-21
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana
TYPE SET	Externally Powered 11 Tube FM-AM Tuner With Stereo Amplifier
TUNING RANGE —BROADCAST	540KC—1620KC FREQ. MOD. 88—108MC

DIAL CORD STRINGING



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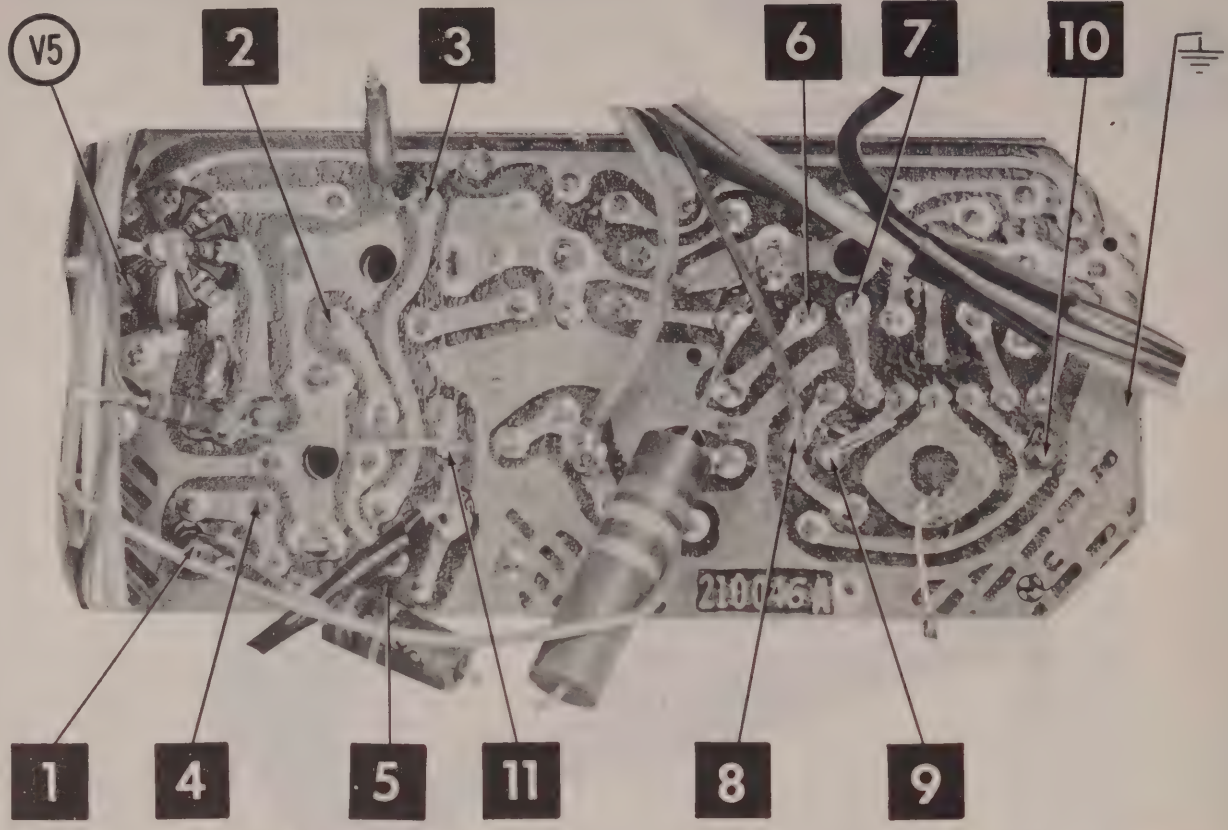
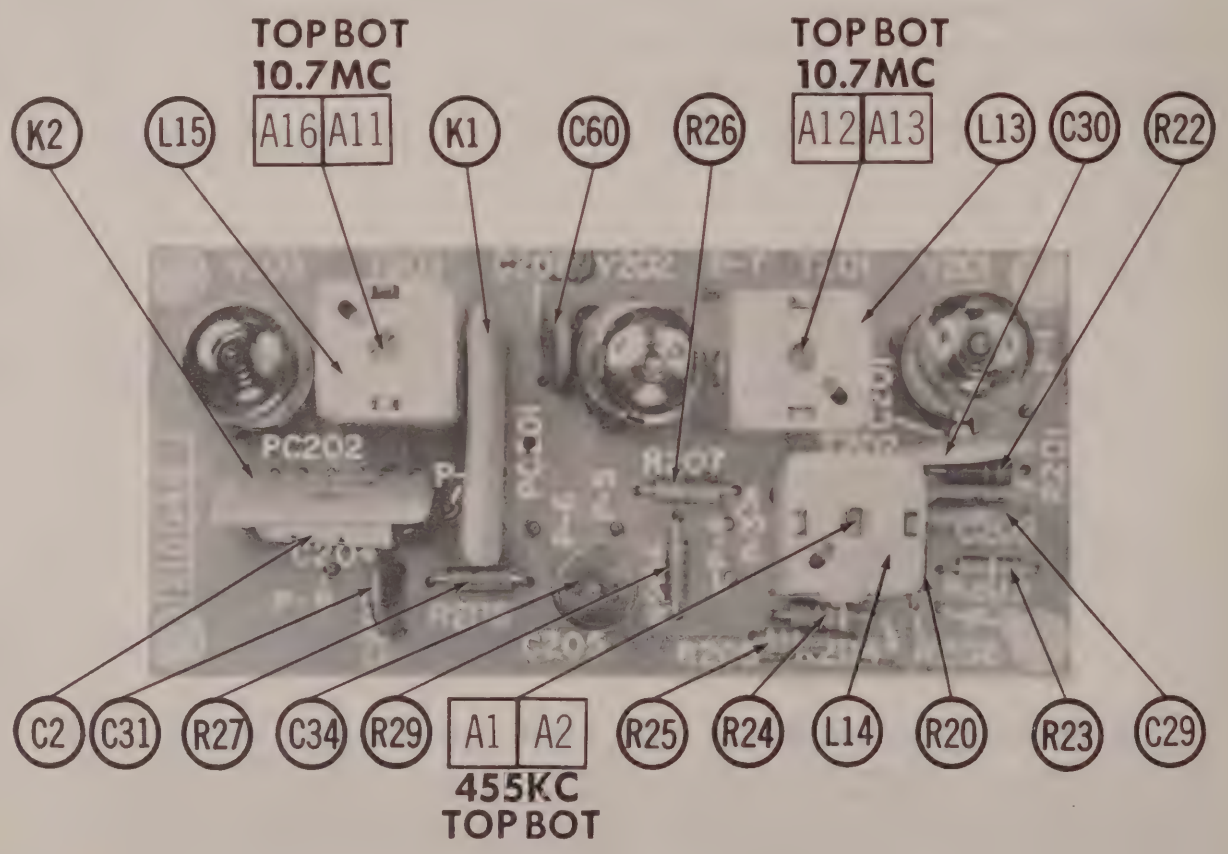


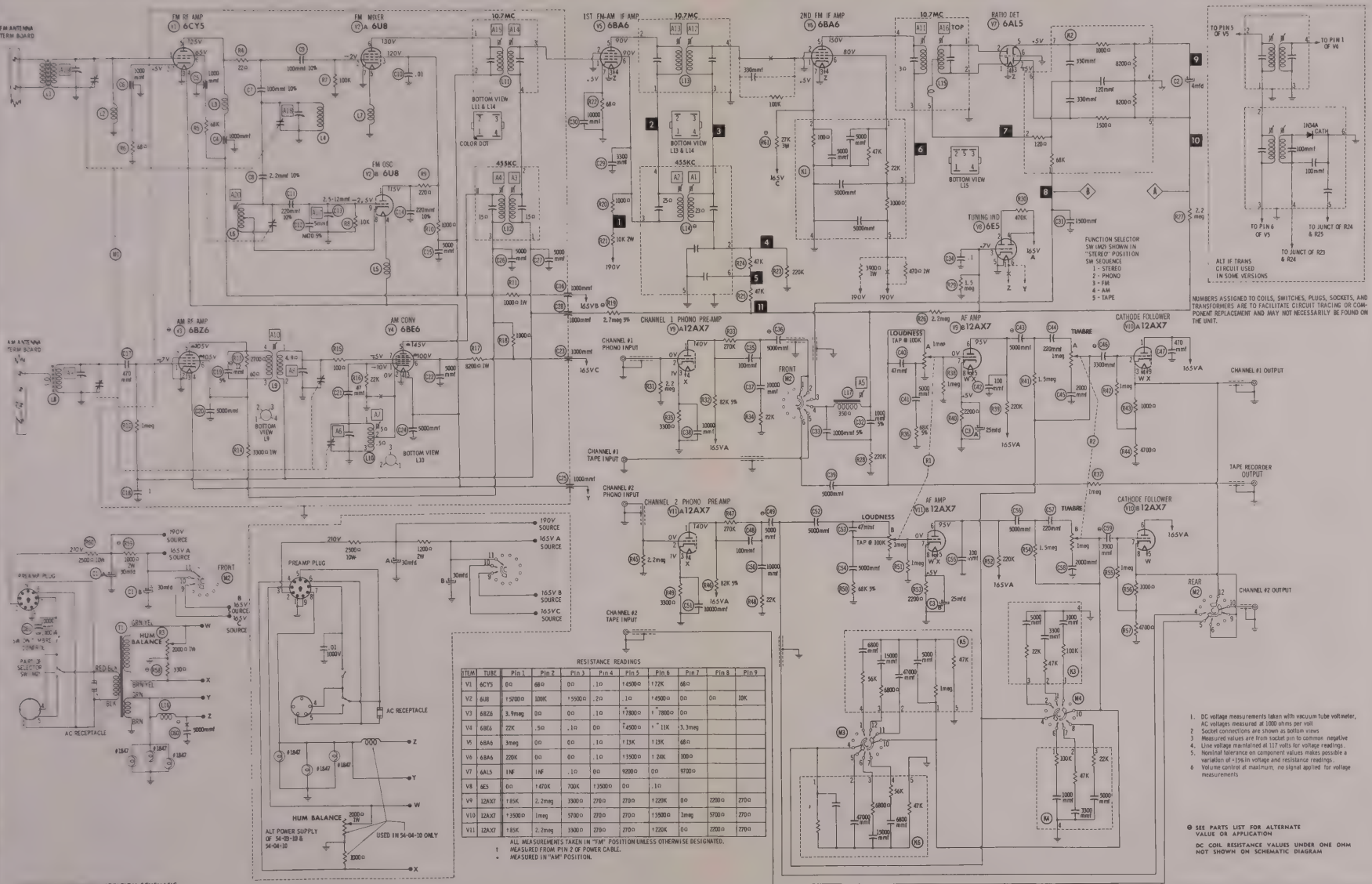
A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PRINTED BOARD - TOP VIEW


FM RF AMP V1 6CY5
FM MIXER V2 A 6U8
FM OSC V2 B 6U8
10.7MC
1ST FM-AM IF AMP V5 6BA6
2ND FM IF AMP V6 6BA6
RATIO DET V7 6AL5
455KC
TUNING IND V8 6E5
FUNCTION SELECTOR SW (M2) SHOWN IN "STEREO" POSITION
SW SEQUENCE
1 - STEREO
2 - PHONO
3 - FM
4 - AM
5 - TAPE
ALT IF TRANS CIRCUIT USED IN SOME VERSIONS
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
AM RF AMP V3 6BZ6
AM CONV V4 6BE6
CHANNEL 1 PHONO PRE-AMP V9 12AX7
AF AMP V9 12AX7
CATHODE FOLLOWER V10 12AX7
CHANNEL 2 PHONO PRE-AMP V11 12AX7
AF AMP V11 12AX7
CATHODE FOLLOWER V10 12AX7
LOUDNESS
TREBLE
CHANNEL #1 OUTPUT
CHANNEL #2 OUTPUT
TAPE RECORDER OUTPUT
CHANNEL #1 PHONO INPUT
CHANNEL #1 TAPE INPUT
CHANNEL #2 PHONO INPUT
CHANNEL #2 TAPE INPUT
PREAMP PLUG
AC RECEPTACLE
HUM BALANCE
ALT POWER SUPPLY OF 54-03-10 & 54-04-10
USED IN 54-04-10 ONLY
190V SOURCE
165V A SOURCE
165V B SOURCE
165V C SOURCE
FRONT
REAR
TO PIN 5 OF V5
TO PIN 1 OF V6
TO PIN 6 OF V5
TO JUNCT OF R24 & R25
TO JUNCT OF R23 & R24
1N48A CATH
BOTTOM VIEW L11 & L14
BOTTOM VIEW L13 & L16
BOTTOM VIEW L15
BOTTOM VIEW L9
BOTTOM VIEW L10
COLOR DOT

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CY5	0Ω	68Ω	0Ω	.1Ω	†4500Ω	†72K	68Ω		
V2	6U8	†5700Ω	100K	†9500Ω	.2Ω	.1Ω	†4500Ω	0Ω	0Ω	10K
V3	6BZ6	3.9meg	0Ω	0Ω	.1Ω	†7800Ω	* †7800Ω	0Ω		
V4	6BE6	22K	.5Ω	.1Ω	0Ω	†4500Ω	* †11K	3.3meg		
V5	6BA6	3meg	0Ω	0Ω	.1Ω	†13K	†13K	68Ω		
V6	6BA6	220K	0Ω	0Ω	.1Ω	†3500Ω	† 26K	100Ω		
V7	6AL5	INF	INF	.1Ω	0Ω	9200Ω	0Ω	9700Ω		
V8	6E5	0Ω	†470K	700K	†3500Ω	0Ω	.1Ω			
V9	12AX7	†85K	2.2meg	3300Ω	270Ω	270Ω	†220K	0Ω	2200Ω	270Ω
V10	12AX7	†3500Ω	1meg	5700Ω	270Ω	270Ω	†3500Ω	1meg	5700Ω	270Ω
V11	12AX7	†85K	2.2meg	3300Ω	270Ω	270Ω	†220K	0Ω	2200Ω	270Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM PIN 2 OF POWER CABLE.
* MEASURED IN "AM" POSITION.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

Ⓐ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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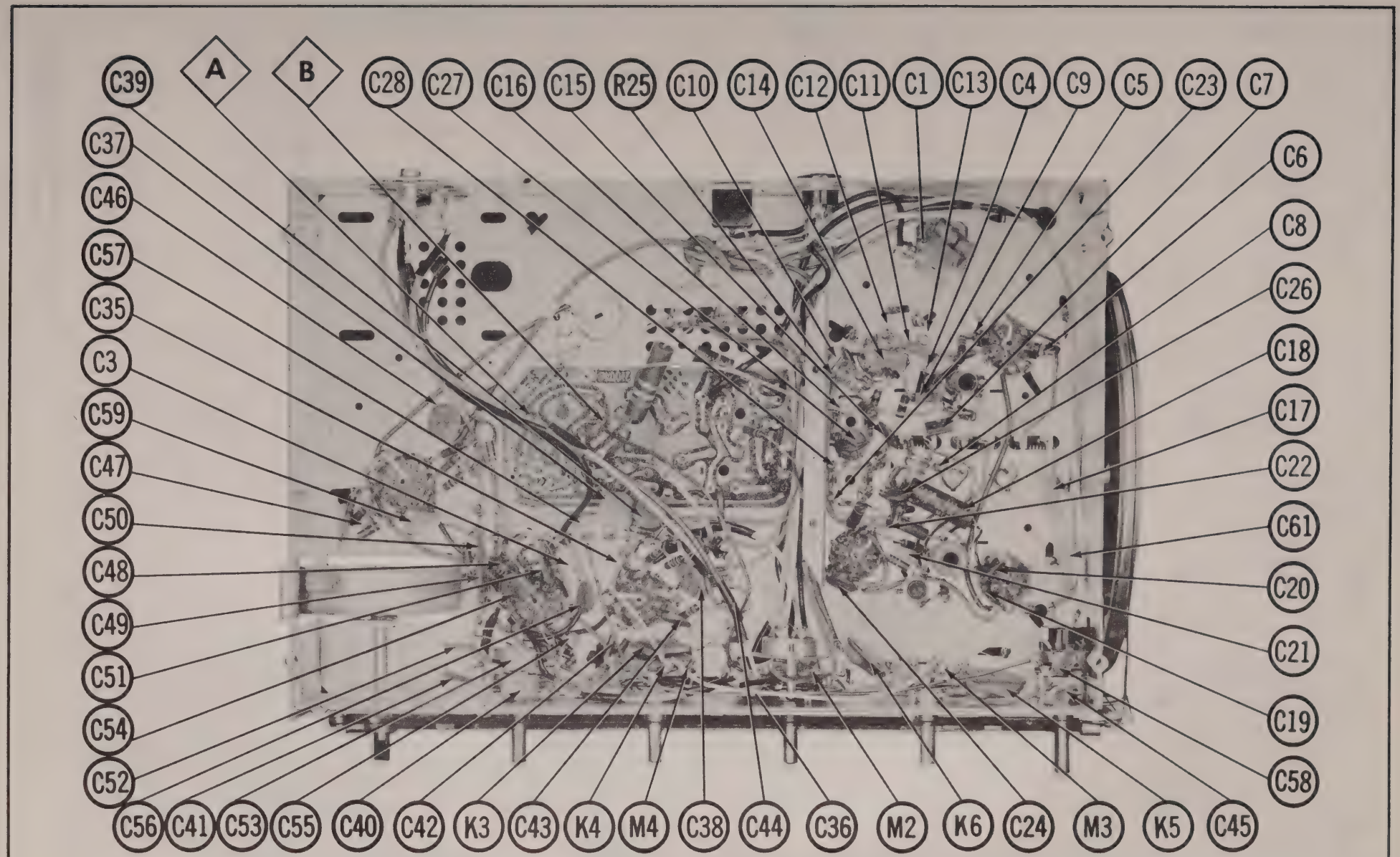
MAGNAVOX CHASSIS 54-03-00, 54-03-10, 54-03-21, 54-04-00, 54-04-10, 54-04-21



CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1, A2, A3, A4, All thru A16..... GENERAL CEMENT #5097, 8727
WALSCO #2515

A5, A17..... GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9298, 5003
WALSCO #2516, 2519

A6, A8, A9, A18, A19..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

A7, A10, A20..... GENERAL CEMENT #8721, 8722
WALSCO #2519

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of AM converter (V4). Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	455KC (10KC Mod.)	"	"	"	A5	Adjust for MINIMUM output.
3.	10mmf	High side to AM antenna terminal. Low side to chassis.	1600KC (400∿ Mod.)	"	1600KC	"	A6	Adjust for maximum output.
4.	"	"	600KC	"	600KC	"	A7	Adjust for maximum output while rocking tuning gang.
5.	"	"	1400KC	"	Tune to 1400KC signal.	"	A8, A9	Adjust for maximum output.
6.	"	"	600KC	"	Tune to 600KC signal.	"	A10	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR & VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	.01mfd	High side to pin 5 (plate) of FM RF amp (V1). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe thru 1meg to point (A). Common to chassis.	A11, A12, A13, A14, A15	Adjust for maximum deflection.
8.	"	"	"	"	"	DC probe thru 1meg to point (B). Common to chassis.	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Repeat Steps 7 & 8.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR & OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7.	.01mfd	High side to pin 5 (plate) of FM RF amp (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference.	Vert. amp. thru 1meg to point (A). Low side to chassis.	A11, A12, A13, A14, A15	Disconnect stabilizing capacitor C2. Adjust for curve of maximum gain and symmetry similar to Fig. 1.
8.	"	"	"	"	"	Vert. amp. thru 1meg to point (B). Low side to chassis.	A16	Reconnect C2. Adjust so that 10.7MC marker occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines. Repeat Steps 7 & 8.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9.	120Ω, 150Ω Carbon Resistors	Across FM antenna terminals with 120Ω in high side and 150Ω in low side.	107MC (Unmod.)	FM	107MC	DC probe thru 1meg to point (A). Common to chassis.	A17, A18, A19	Adjust for maximum deflection.
10.	"	"	89MC	"	89MC	"	A20	Adjust for maximum deflection. Repeat Steps 9 & 10.

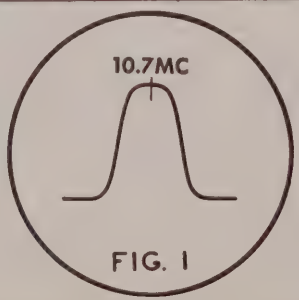


FIG. 1

FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6CY5	
V2	FM Mixer-FM Osc.	6U8	
V3	AM RF Amplifier	6BZ6	①
V4	AM Converter	6BE6	
V5	1st FM-AM IF Amplifier	6BA6	
V6	2nd FM IF Amplifier	6BA6	

ITEM No.	USE	TYPE	NOTES
V7	Ratio Detector	6AL5	
V8	Tuning Indicator	6E5	
V9	Channel 1 Phono Preamp-Channel 1 AF Amp.	12AX7	
V10	Channel 1 Cath. Follower-Channel 2 Cath. Follower	12AX7	
V11	Channel 2 Phono Preamp.-Channel 2 AF Amp.	12AX7	

① 6BA6 Used in Chassis 54-03-21

ELECTROLYTIC CAPACITORS

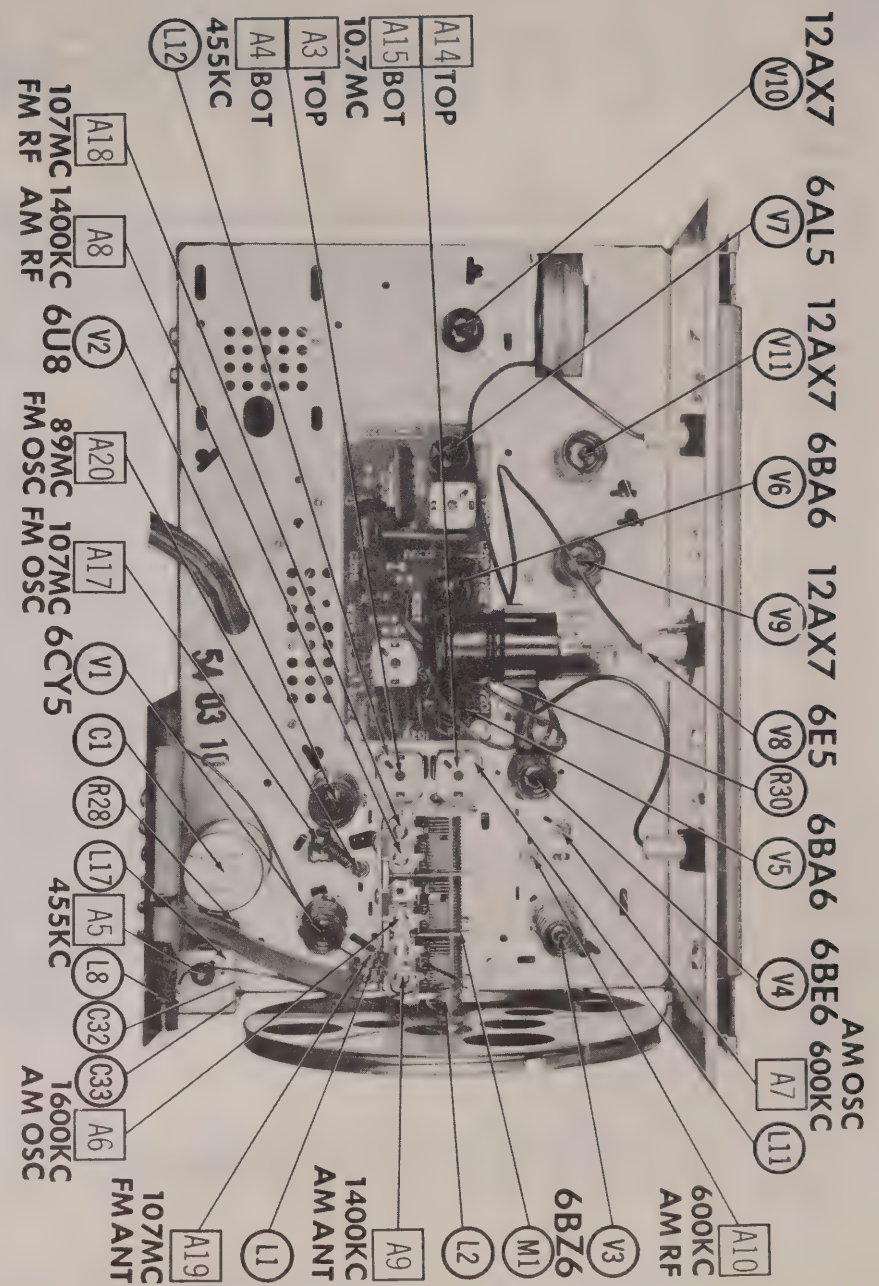
ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲30	450	270021-58	AFH2-54	B0430	FP237	TMD-52	TVL-2759	
B	▲30	450							
C2	4	50	270559-9	PWE50005	EC5-50	TT50X4	ML4-50	TE-1302.1	
C3A	25	25	270043-1	PRS25V25	BBR25-25	TCD26	TD-25-25	TVA-1205	
B	25	25		PRS25V25	BBR25-25		TD-25-25	TVA-1205	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	1000			250276-1	EF-001	MFT-1000			503C-D1	
C5	1000			250276-2	EF-001	MFT-1000			503C-D1	
C6	1000			250276-2	EF-001	MFT-1000			503C-D1	
C7	100		10%	250187-53	1469-0001	D6-101	22R5T1	MCB235	MS-31	
C8	2.2		10%	250221-118	NPO-SI 2.2	TCZ-2R2	C10V22C	CNO-522	5TCCB-V22S 10%*	
C9	100		10%	250187-53	1469-0001	D6-101	22R5T1	MCB235	MS-31	
C10	.01	400		250211-7	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C11	220		10%	250187-57	1469-00022	D6-221	22R5T22	JL-322	5GA-T22S 10%*	
C12	5		N470 5%	250088-138						
C13	2.5-12			250188-9						
C14	220		10%	250187-57	1469-00022	D6-221	22R5T22	JL-322	5GA-T22S 10%*	
C15	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C16	1000			250276-1	EF-001	MFT-1000			503C-D1	
C17	470			250159-102	1467-00047	D6-471	5W5T47	MC245	1FM-347	
C18	.1	100		250261-125	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C19	12		5%	250088-179		TCZ-12	C10Q12C	CNO-412	5GA-Q12S 5%*	
C20	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C21	47			250218-17	BPD-000047	DD-470	L10Q47	UC-5447	5GA-Q47	
C22	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C23	1000			250276-1	EF-001	MFT-1000			503C-D1	
C24	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C25	1000			250276-1	EF-001	MFT-1000			503C-D1	
C26	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C27	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C28	1000			250276-1	EF-001	MFT-1000			503C-D1	
C29	3300			250234-154	BPD-0033	DD-332	BYA10D33	B-233	5HK-D33	
C30	10000			250234-66	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C31	1500			250234-136	BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C32	1000		5%	250218-8	1464-001		1R5D1	MCE255	MS-21	
C33	1000		5%	250218-8	1464-001		1R5D1	MCE255	MS-21	
C34	.1	200		250240-13	P2151N-1	DF-104	BC2P1J	ACE401	2SE-P10	
C35	100			250218-22	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	

CHASSIS—TOP VIEW



PARTS LIST & DESCRIPTION (continued)

CAPACITORS (cont)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C36	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	①
C37	10000			250218-19	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C38	10000			250218-19	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C39	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C40	47			250218-17	BPD-000047	DD-470	L10Q47	UC-5447	5GA-Q47	
C41	5000			250218-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C42	100			250218-22	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C43	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	①
C44	220			250218-5	BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C45	2000			250218-20	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C46	3300			250234-154	BPD-0033	DD-332	BYA10D33	B-233	5HK-D33	②
C47	470			250218-6	BPD-00047	DD-471	BYA10T47	B-347	5GA-T22	
C48	100			250218-22	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C49	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	①
C50	10000			250218-19	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C51	10000			250218-19	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C52	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C53	47			250218-17	BPD-000047	DD-470	L10Q47	UC-5447	5GA-Q47	
C54	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C55	100			250218-22	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C56	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	①
C57	220			250218-5	BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C58	2000			250218-20	BPD-002	DD-202	BYA10D2	B-202	5HK-D2	
C59	3300			250234-154	BPD-0033	DD-332	BYA10D33	B-233	5HK-D33	②
C60	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	③
C61	10000	1400		250219-2	DAC-27	DD-103	HVE16S1	GEM-1611	20HKB-S1	

① Some versions may use 10000mmf in this application (Part #250218-19).
② Some versions may use 10000mmf (Part #250218-19) or 5000mmf (Part #250175-30) in this application.
③ Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg		220151-1 ①				▪ UE3957	Loudness, Chan. 1
B	1meg		①					Loudness, Chan. 2
R2A	1meg		220150-4					Timbre, Chan. 1
B	1meg							Timbre, Chan. 2
C	Switch							Push-Pull (Power)
R3	2000Ω	1 (ww)	220120-4		39-2000		FL2K	Hum Balance

① Tap @ 100K

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R4	22Ω		230104-42	
R5	68K		230104-54	
R6	68Ω		230104-48	
R7	100K		230104-86	
R8	10K		230104-74	
R9	220Ω		230104-50	
R10	1000Ω		230104-62	
R11	1000Ω	1	230105-62	
R12	1meg		230104-98	
R13	2700Ω		230104-67	Note 1
R14	3300Ω	1	230105-68	
R15	100Ω		230104-50	
R16	22K		230104-78	
R17	8200Ω	1	230105-73	
R18	1000Ω		230104-62	
R19	2.7meg5%			Note 2
R20	1000Ω		230104-62	
R21	10K	2	230106-1074	
R22	68Ω		230104-48	
R23	220K		230104-90	
R24	47K		230104-82	
R25	47K		230104-82	
R26	2.2meg		230104-102	
R27	2.2meg		230104-102	
R28	220K		230104-90	
R29	1.5meg		230104-100	
R30	470K		230104-94	
R31	2.2meg		230104-102	
R32	82K 5%		230104-85	
R33	270K		230104-91	
R34	22K		230104-78	
R35	3300Ω		230104-68	
R36	68K 5%		230104-84	
R37	1meg		230104-98	
R38	1meg		230104-98	
R39	220K		230104-90	
R40	2200Ω		230104-66	
R41	1.5meg		230104-100	
R42	1meg		230104-98	
R43	1000Ω		230104-62	
R44	4700Ω		230104-70	
R45	2.2meg		230104-102	
R46	82K 5%		230104-85	
R47	270K		230104-91	
R48	22K		230104-78	
R49	3300Ω		230104-68	
R50	68K 5%		230104-84	
R51	1meg		230104-98	
R52	220K		230104-90	
R53	2200Ω		230104-66	
R54	1.5meg		230104-100	
R55	1meg		230104-98	
R56	1000Ω		230104-62	
R57	4700Ω		230104-70	
R58	330Ω			Note 3
R59	1000Ω	2	230146-13	Note 4
R60	2500Ω	10	240071-39	
R61	27K	3		

Note 1. Chassis 54-03-21 uses 820Ω in this application.
Note 2. Some versions may use 2.2meg 5% in this application (Part #230104-102).
Note 3. Some versions may use 1000Ω in this application (Part #230104-62).
Note 4. Some versions may use 1200Ω 2W in this application (Part #230106-1063).

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .23A	6.3V @ .57A	6.3V @ 2.7A	320076-1	26F63 ①	P-2961 ①			26F63 ①	F-32A ①

① Drill new mounting holes.

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MAGNAVOX PART No.	REPLACEMENT DATA
K1	2nd FM IF Coupling	(4) 5000mmf, 100Ω, 1000Ω, 22K, 47K	250255-1	Sprague FS-7
K2	FM Detector Coupling	120mmf, (2) 330mmf, 120Ω, 1000Ω, 1500Ω, (2) 8200Ω, 68K	250254-1	Sprague C-9
K3	Treble Comp.	1000mmf, 3300mmf, 5000mmf, 22K, 47K, 100K	250292-2	
K4	Bass Comp.	5000mmf, 6800mmf, .015mfd, .047mfd, 6800Ω, 47K, 56K, 1meg	250291-1	Sprague TCS-16

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M1	Tuning Cap.	260147-1	5 Section; Ant. 28—322mmf, RF 15—280mmf, Osc. 22—151mmf
M2	Switch	160293-3	Band Selector
M3	Switch	160278-2	Bass (Rotary Type)
M4	Switch	160278-2	Treble (Rotary Type)
	Printed Board	210046A	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MAGNAVOX PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Trans.	360491-4						
L2	FM Ant. Coil	360750-1						
L3	RF Choke	360522-9	19-1002	19-1002	BC-563	4606		2uh
L4	FM RF Coil	360751-1						
L5	Fil. Choke	360522-9	19-1002	19-1002	BC-563	4606		2uh
L6	FM Osc. Coil	360628-1						
L7	Fil. Choke	360522-9	19-1002	19-1002	BC-563	4606		2uh
L8	Loopstick	360746-1						
L9	AM RF Trans.	360753-1						
L10	AM Osc. Coil	360752-1	14-1055	14-1055	BC-393	70-OSC*		
L11	1st FM IF Trans.	360626-1	16-3487	16-3487	FM-254	1463		
L12	1st AM IF Trans.	360611-1	16-6758	16-6758	BC-352	12-C1	RF-1	
L13	2nd FM IF Trans.	360747-1	16-3490	16-3490		1463-PC		
L14	2nd AM IF Trans.	360781-1 †	16-6781	16-6781		13-PC6		
L15	Ratio Detector	360748-1				1465-PC		
L16	Fil. Choke	360522-9	19-1002	19-1002	BC-563	4606		2uh
L17	10KC Filter Choke	360621-1						490MH

† Some versions may use Part #360749-1 or 360781-2 in this application.
* Disregard pri.

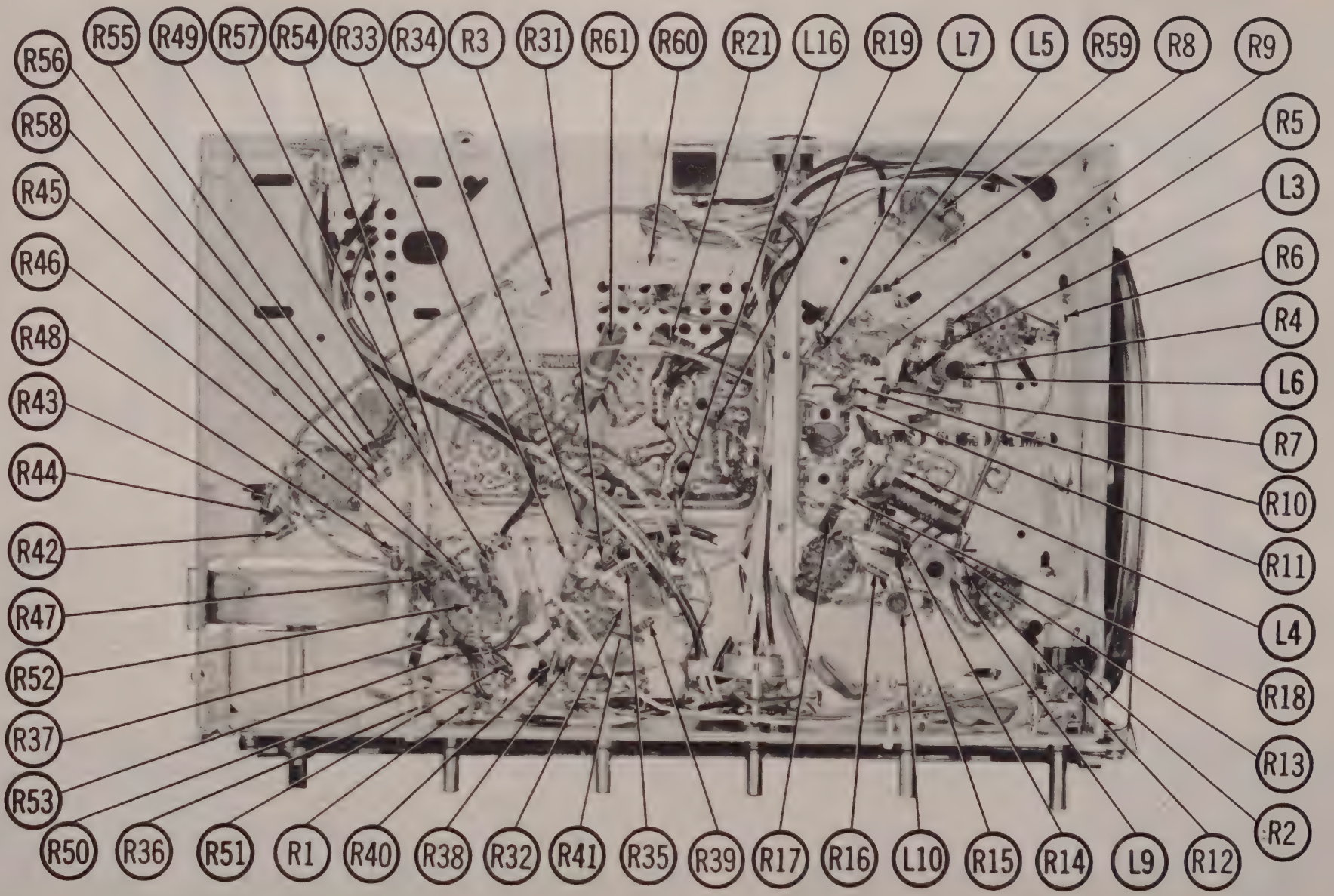
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Pointer	635321-1	
Dial Glass	150534-1	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)



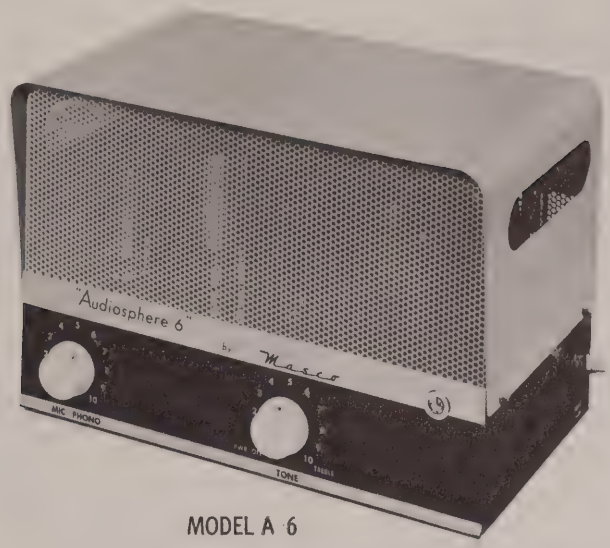
CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

PHOTOFACT* Folder

EIA MEMBER

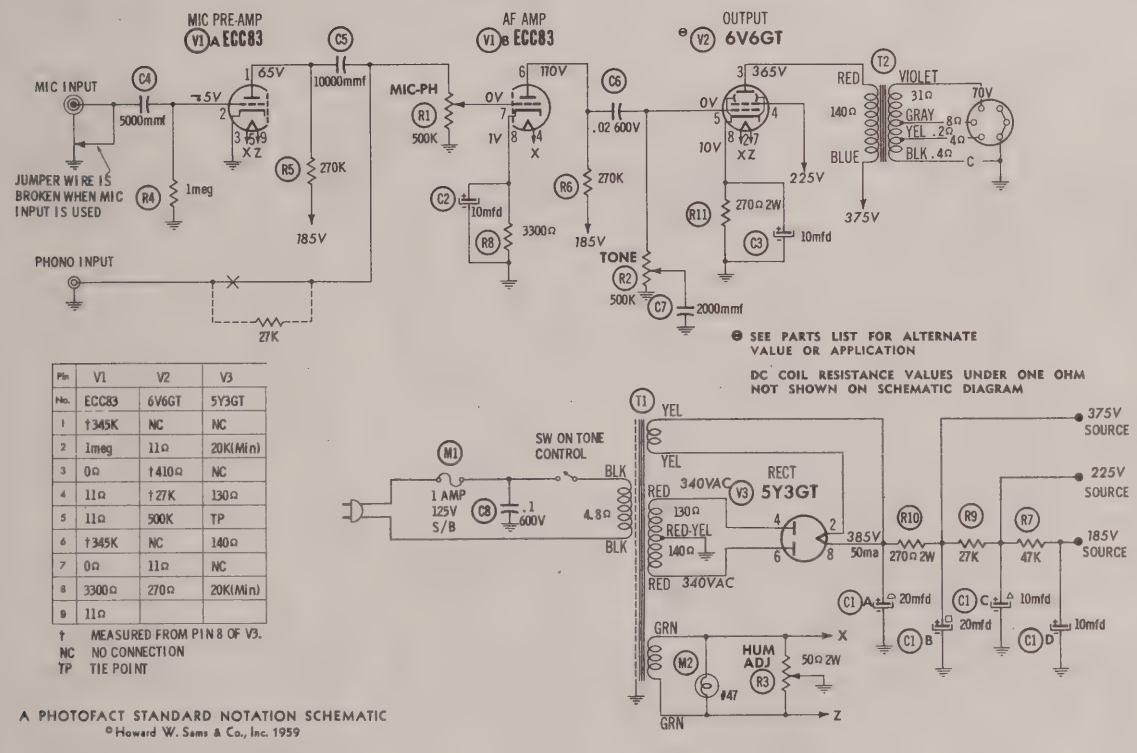
MASCO MODELS A-6, A-8, AS-6, AS-8

MASCO MODELS A-6, A-8, AS-6, AS-8



MODEL A 6

TRADE NAME	Masco Models A-6, A-8, AS-6, AS-8
MANUFACTURER	Mark Simpson Mfg. Co., Inc., 32-28 49th St., Long Island City 3, N. Y.
TYPE SET	AC Operated 3 Tube Audio Amplifier
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 47 Watts, .47 Amp. @ 117 Volts AC



Pin No.	V1	V2	V3
1	†345K	NC	NC
2	1meg	11Ω	20K(Min)
3	0Ω	†410Ω	NC
4	11Ω	†27K	130Ω
5	11Ω	500K	TP
6	†345K	NC	140Ω
7	0Ω	11Ω	NC
8	3300Ω	270Ω	20K(Min)
9	11Ω		

† MEASURED FROM PIN 8 OF V3.
NC NO CONNECTION
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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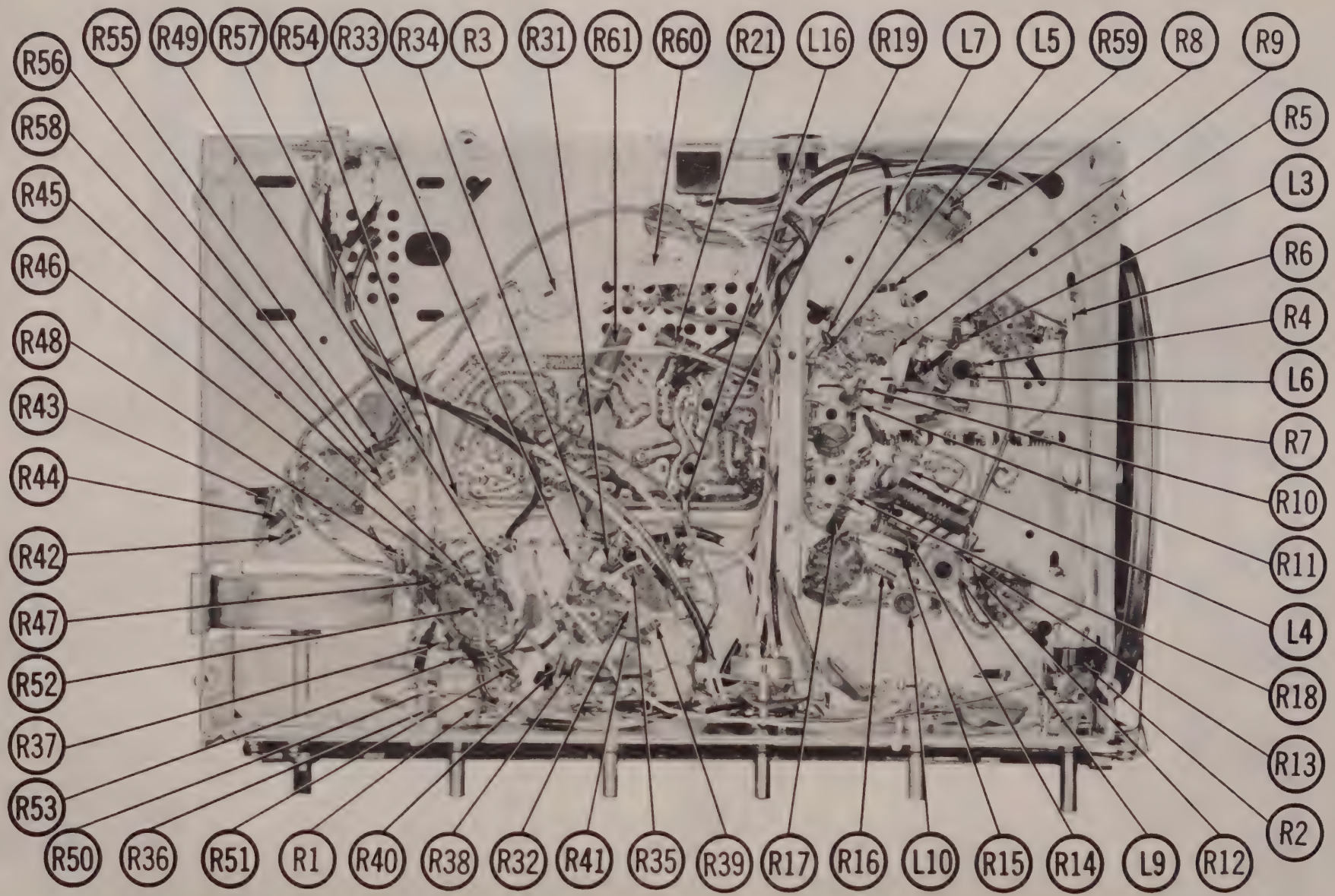
J62

SET 452 FOLDER 12



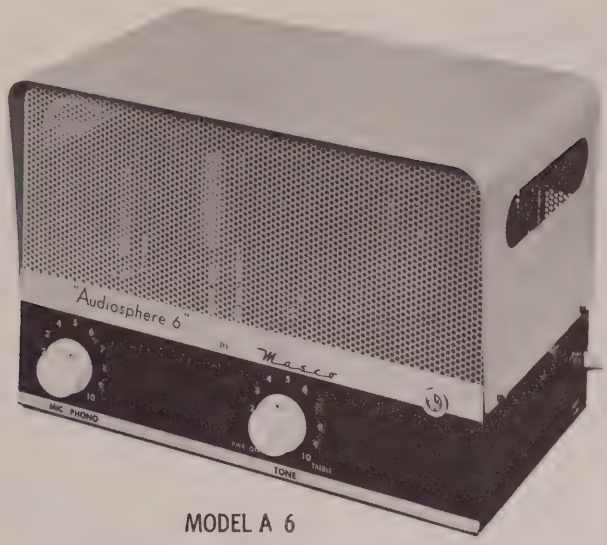
CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

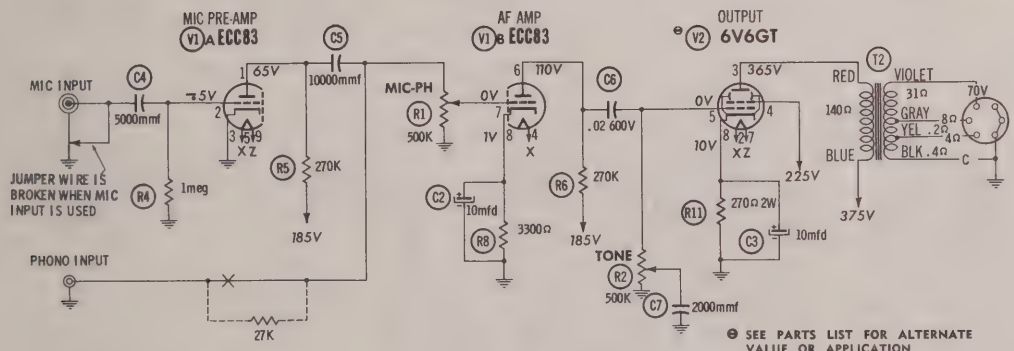
MASCO MODELS A-6, A-8, AS-6, AS-8

MASCO MODELS A-6,
A-8, AS-6, AS-8



MODEL A 6

TRADE NAME	Masco Models A-6, A-8, AS-6, AS-8
MANUFACTURER	Mark Simpson Mfg. Co., Inc., 32-28 49th St., Long Island City 3, N. Y.
TYPE SET	AC Operated 3 Tube Audio Amplifier
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 47 Watts, .47 Amp. @ 117 Volts AC

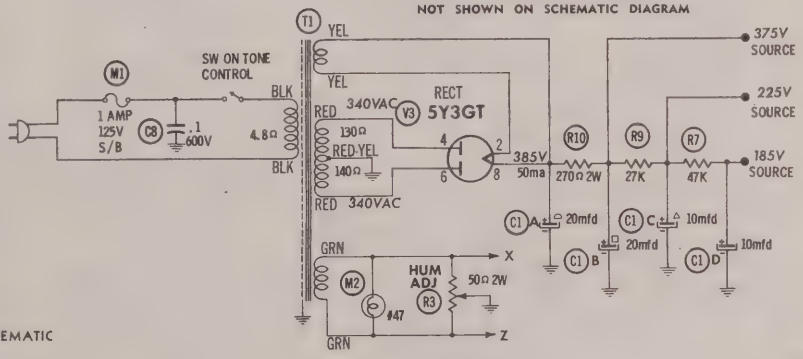


⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

Pin No.	V1	V2	V3
1	†345K	NC	NC
2	1meg	11Ω	20K(Min)
3	0Ω	†410Ω	NC
4	11Ω	†27K	130Ω
5	11Ω	500K	TP
6	†345K	NC	140Ω
7	0Ω	11Ω	NC
8	3300Ω	270Ω	20K(Min)
9	11Ω		

† MEASURED FROM PIN 8 OF V3.
NC NO CONNECTION
TP TIE POINT



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MASCO MODELS A-6,
A-8, AS-6, AS-8

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SET 452 FOLDER 12

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Mic Preamplifier - AF Amplifier	ECC83/12AX7

ITEM No.	USE	TYPE
V2	Output	6V6GT ①
V3	Rectifier	5Y3GT

① 6L6GB used in Models A-8, AS-8.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MASCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲20	450		AFH4-19-10	D0179.3	FP474.5	TMQ-11	TVL-4832	
B	■20	450					TD-10-450		
C	▲10	450							
D	10	450							
C2	10	50		PRS50V10	BBR10-50	TC32	TD-10-50	TVA-1304	
C3	10	50		PRS50V10	BBR10-50	TC32	TD-10-50	TVA-1304	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA MASCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C5	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C6	.02	600			P688N-02	DD-203	CUB6S2	GEM-612	6TM-S2	
C7	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C8	.1	600			P688N-1	DF-103	CUB6P1	GEM-601	6TM-P1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MASCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	BA811-1958	B-60	A47-500K-Z	Q13-133	U48	Mic. & Phono
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R2A	500K	½	2491	B-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	
R3A	50Ω	2(WW)	18-W-3010	WN-500	A43-50	W11-050	C50P	Hum Adjust
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

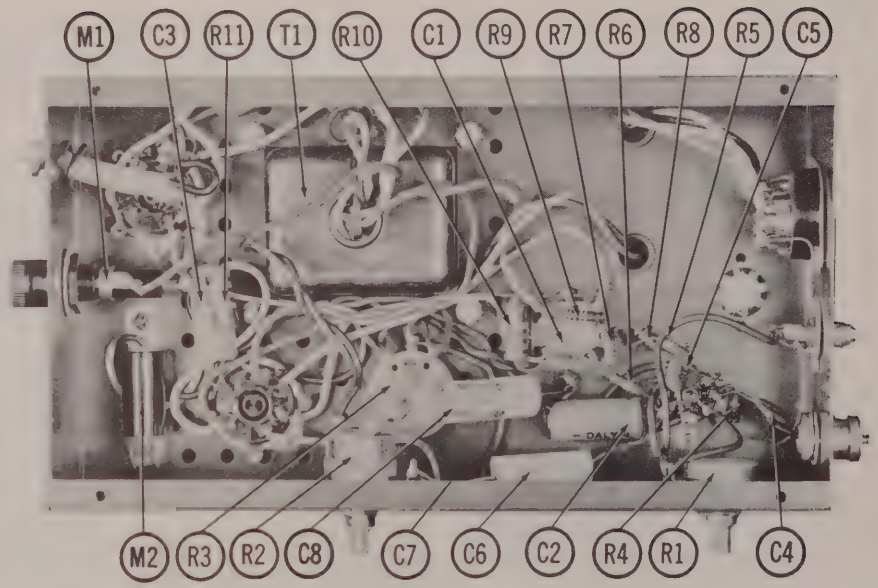
ITEM No.	RATING OHMS	RATING WATT	MASCO PART No.	NOTES
R4	1meg			
R5	270K			
R6	270K			
R7	47K			

ITEM No.	RATING OHMS	RATING WATT	MASCO PART No.	NOTES
R8	3300Ω			
R9	27K			
R10	270Ω	2		
R11	270Ω	2		

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA MASCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .6A	680VCT @ .050A	5V @ 2A	A-10	24R02	P-2952		PM8408	24R02	R-11B
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ .9A									

CHASSIS BOTTOM VIEW



TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MASCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5000Ω	500Ω (70V) Tap @ 8Ω, 4Ω	T-6810							

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA MASCO PART No. FUSE	MASCO PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1A 125V S/B *			31300L (3AG 1A 125V S/B)	342001	MDL1	HKP

* Some versions may use a 2 Amp. Quick Blow Fuse in this application.

MISCELLANEOUS

ITEM No.	PART NAME	MASCO PART No.	NOTES
M2	Lamp		#47

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

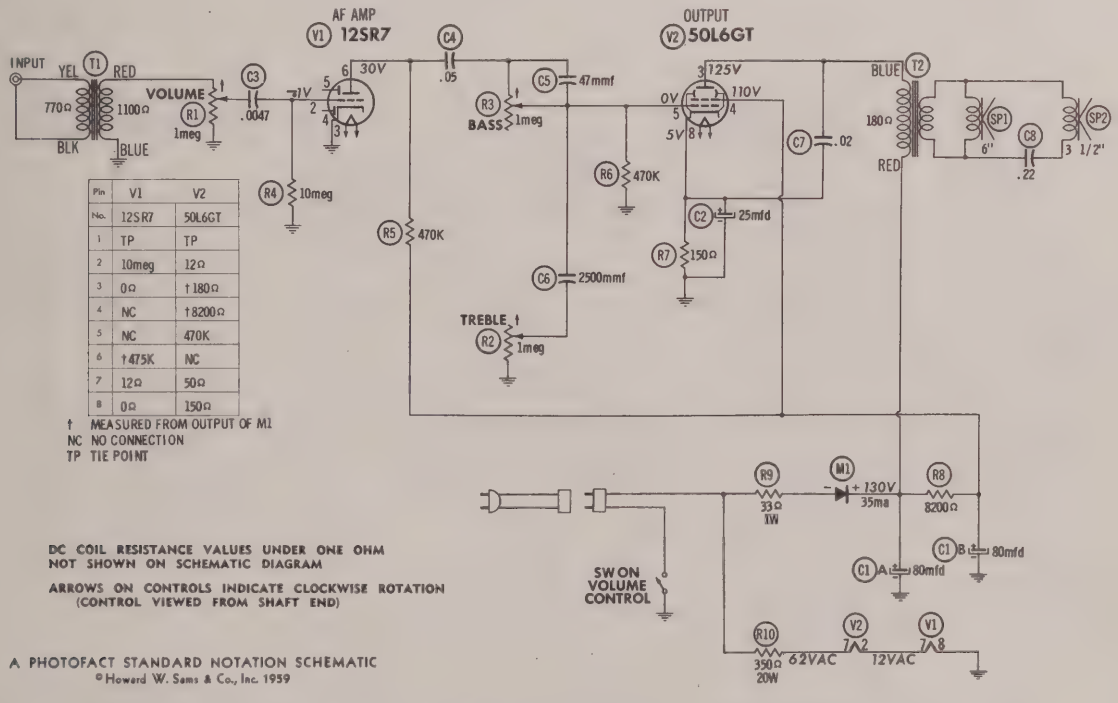
PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

OLYMPIC MODEL SA810

OLYMPIC MODEL
SA810

TRADE NAME	Olympic Model SA810
MANUFACTURER	Olympic Radio & Tel. Corp., 34-01 38th Ave., Long Island City 1, N. Y.
TYPE SET	AC Operated 2 Tube Audio Amplifier
POWER SUPPLY	110-120 Volts AC-DC RATING 27 Watts, .28 Amp. @ 117 Volts AC



Pin No.	V1 12SR7	V2 50L6GT
1	TP	TP
2	10meg	12Ω
3	0Ω	†180Ω
4	NC	†8200Ω
5	NC	470K
6	†475K	NC
7	12Ω	50Ω
8	0Ω	150Ω

† MEASURED FROM OUTPUT OF M1
NC NO CONNECTION
TP TIE POINT

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

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J135

SET 452 FOLDER 13

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12SR7	

ITEM No.	USE	TYPE	NOTES
V2	Output	50L6GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150		PRS150V8050	BBRD101015	TCD498	TDLD-13	TVA-2462	
B	80	150							
C2	25	25		PRS25V25	BBR25-25	TC26	TD-25-25	TVA-1205	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.0047	400			P488N-0047	DD-472	CUB4D47	GEM-6247	6TM-D47	
C4	.05	200			P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C5	47				SI 47	D6-470	L10Q47	UC-5447	5GA-Q47	
C6	2500				SI 2500	D6-252	L10D25	UC-5225	5HK-D25	
C7	.02	400			P488N-02	DD-203	CUB4S2	GEM-412	4TM-S2	
C8	.22	400			P488N-22		CUB4P22	GEM-4022	4TM-P22	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	BA812-1116	B-70-S	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power On-Off
R2A	1meg	½	BA811-2465	B-70	A47-1meg-Z	Q13-137	U53	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	1meg	½	BA811-2465	B-70	A47-1meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R4	10meg			
R5	470K			
R6	470K			
R7	150Ω			

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R8	8200Ω			
R9	33Ω	1		
R10	350Ω	20		

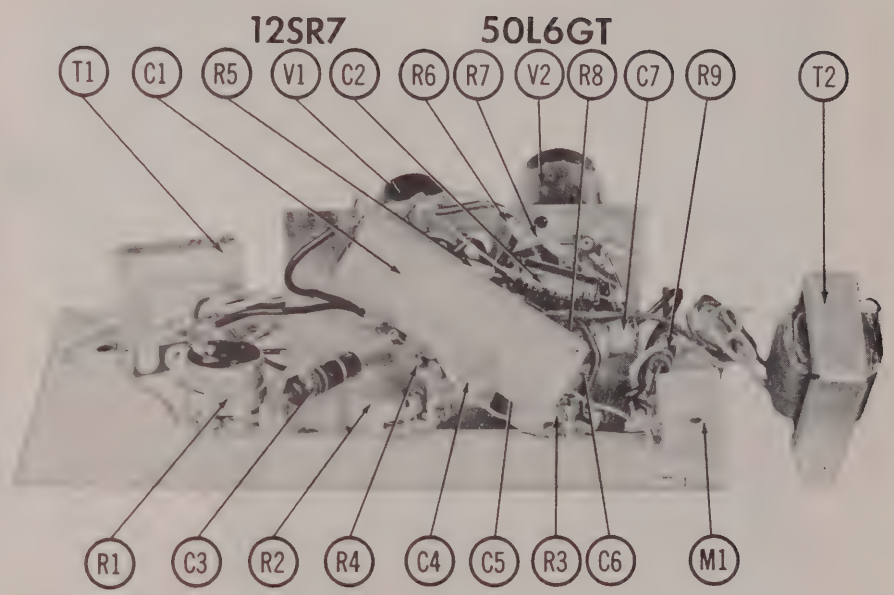
TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1	1	TR25729						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2300Ω	3-4Ω		22S45	A-2928	AU-603	A-3876	22S45	S-1X	

CHASSIS BOTTOM VIEW



SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω		6A1	
SP2	3½"	PM	3-4Ω		3A15T	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	OLYMPIC PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.035A		1234AH	RS050		Model 65A	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

OLYMPIC MODELS
541, 550, 551

OLYMPIC MODELS
541, 550, 551

MODEL 551

TRADE NAME	Olympic Models 541, 550, 551
MANUFACTURER	Olympic Radio & Tel. Corp., 34-01 38th Ave., Long Island City 1, N. Y.
TYPE SET	AC-DC Operated 5 Tube AM Receiver
POWER SUPPLY	110 - 120 Volts AC-DC
RATING	28 Watts, .30 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	535KC - 1650KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1 and A2..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A3 and A4..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to antenna stator lug of tuning gang. Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001mfd to reduce hum modulation.
2.		Loop	1650KC	"	"	A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	1500KC	"	A4	Adjust for maximum output. Repeat steps 2 and 3.

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J106

SET 452 FOLDER 14

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12AU6	
V3	Det. -AVC-AF Amp.	12AV6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	70	150	150-135	PRS150V8040	BBRD8415	WD220	TDLD-10	TVA-2460	
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	50			156-107	SI 50	D6-500	L10Q5	UC-545	5GA-Q5	
C3	6.8			168-102	NPO-SI 6.8	TCZ-6R8	C10V68C	ZT-5568	57CCB-V68	
C4	.05	200		152-104	P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C5	10000			158-102	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C6	.05	400		152-105	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C7	.1	400		152-108	P488N- 1	DF-104	CUB4P1	GEM-401	4TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	①	B-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	On/ Off

① Some versions may use 1meg (Part #120-142) in this application. Model 541 used Part #120-119.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

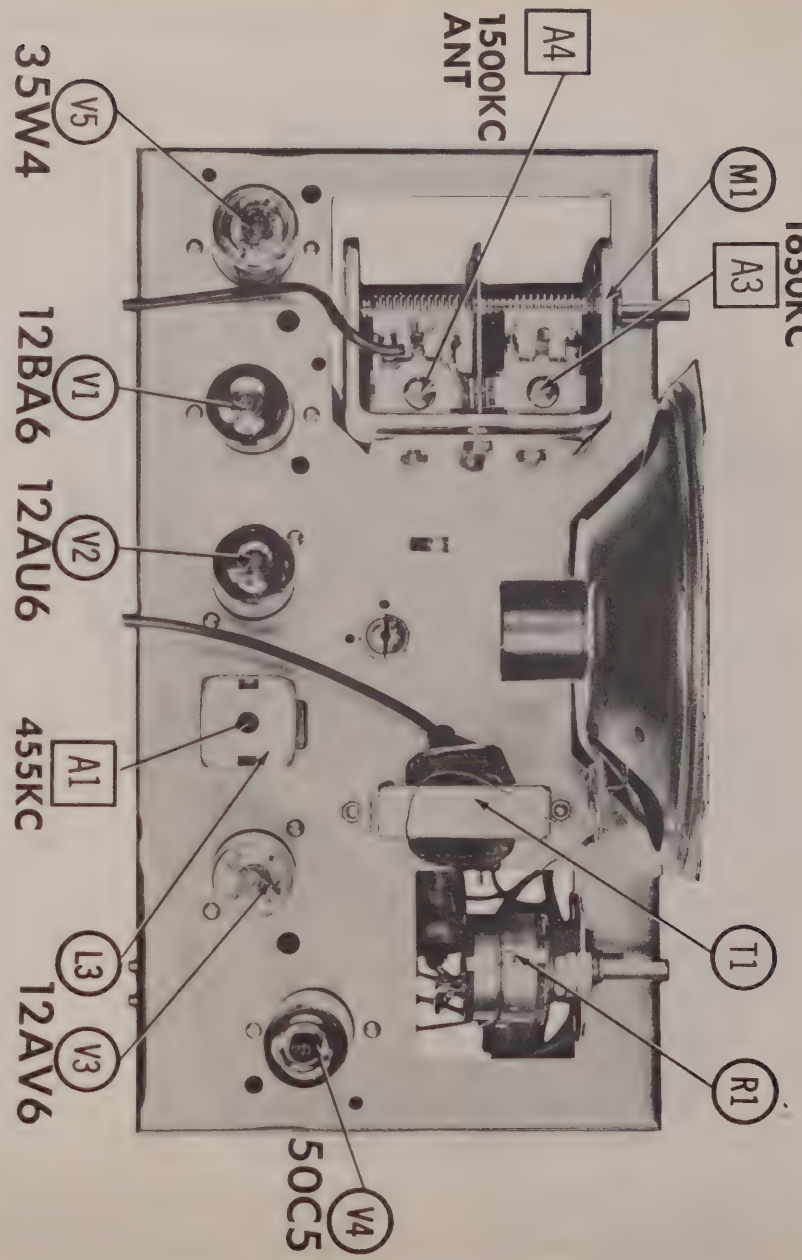
ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R2	4700Ω		180-133	
R3	56Ω		180-173	
R4	2.2meg		180-107	

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R5	2.2meg		180-107	
R6	150Ω		180-111	
R7	1500Ω	1	180-157	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		OLYMPIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loop Ant.	225-150						Includes back cover
L2	Osc. Coil	136-124A						
L3	IF Trans.	130-106	16-6764	16-6764				

CHASSIS—TOP VIEW



PARTS LIST & DESCRIPTION (continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2200Ω	3-4Ω	138-118B	24S53	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	175-137	4A05	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	OLYMPIC PART No.	REPLACEMENT DATA	
K1	Det. Audio Coupling Net	220mmf, 250mmf, total, 5000mmf 5000mmf, 470K, 470K, 6.8meg	166-111	Aerovox Centralab Cornell-Dubilier Sprague	PA-113-2 PC-151 116TM2 DT-2

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M1	Tuning Cap.	160-110C	2 Gang, Ant. 30 - 420mmf, Osc. 18 - 162mmf

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

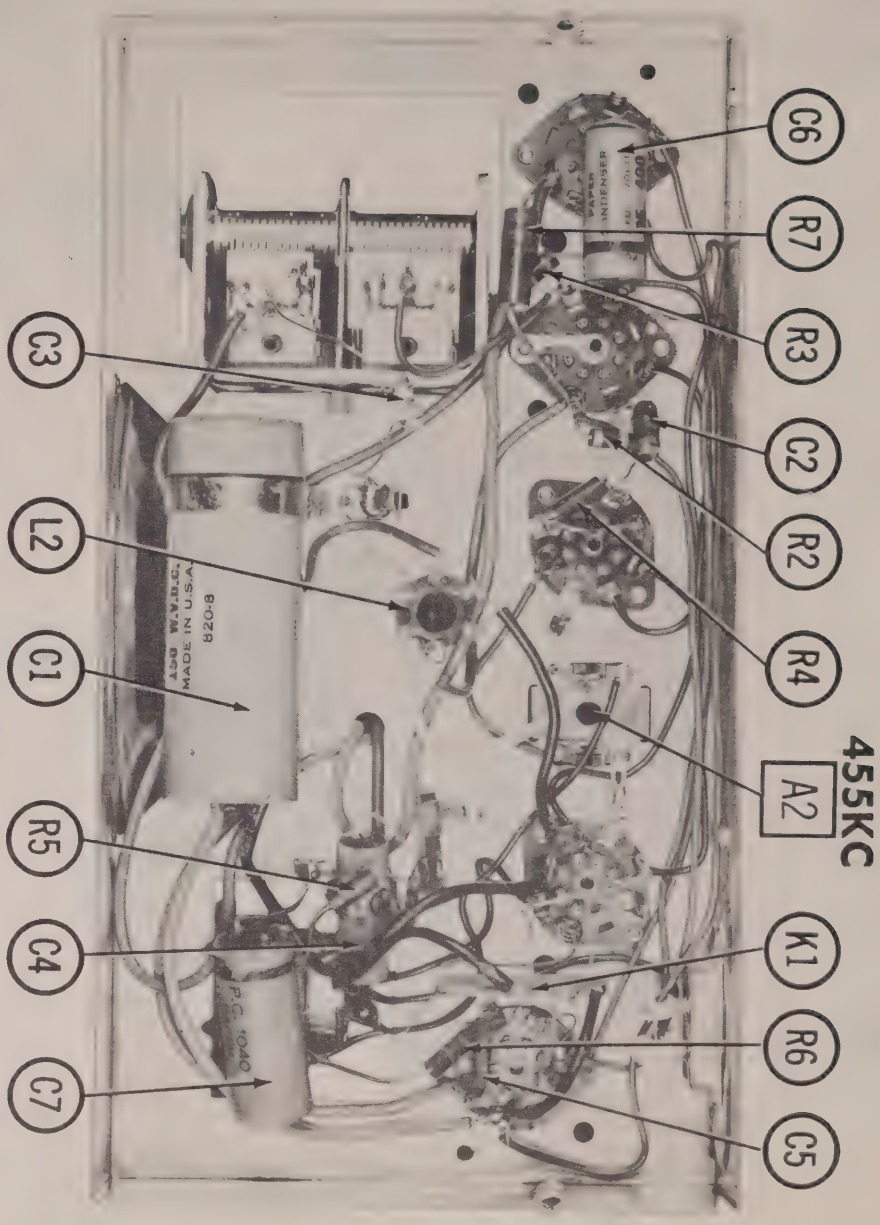
NAME	PART NO.	DESCRIPTION
Knob	220-163	Tuning
Knob	220-162	Volume-On-Off
Cabinet	210-163	

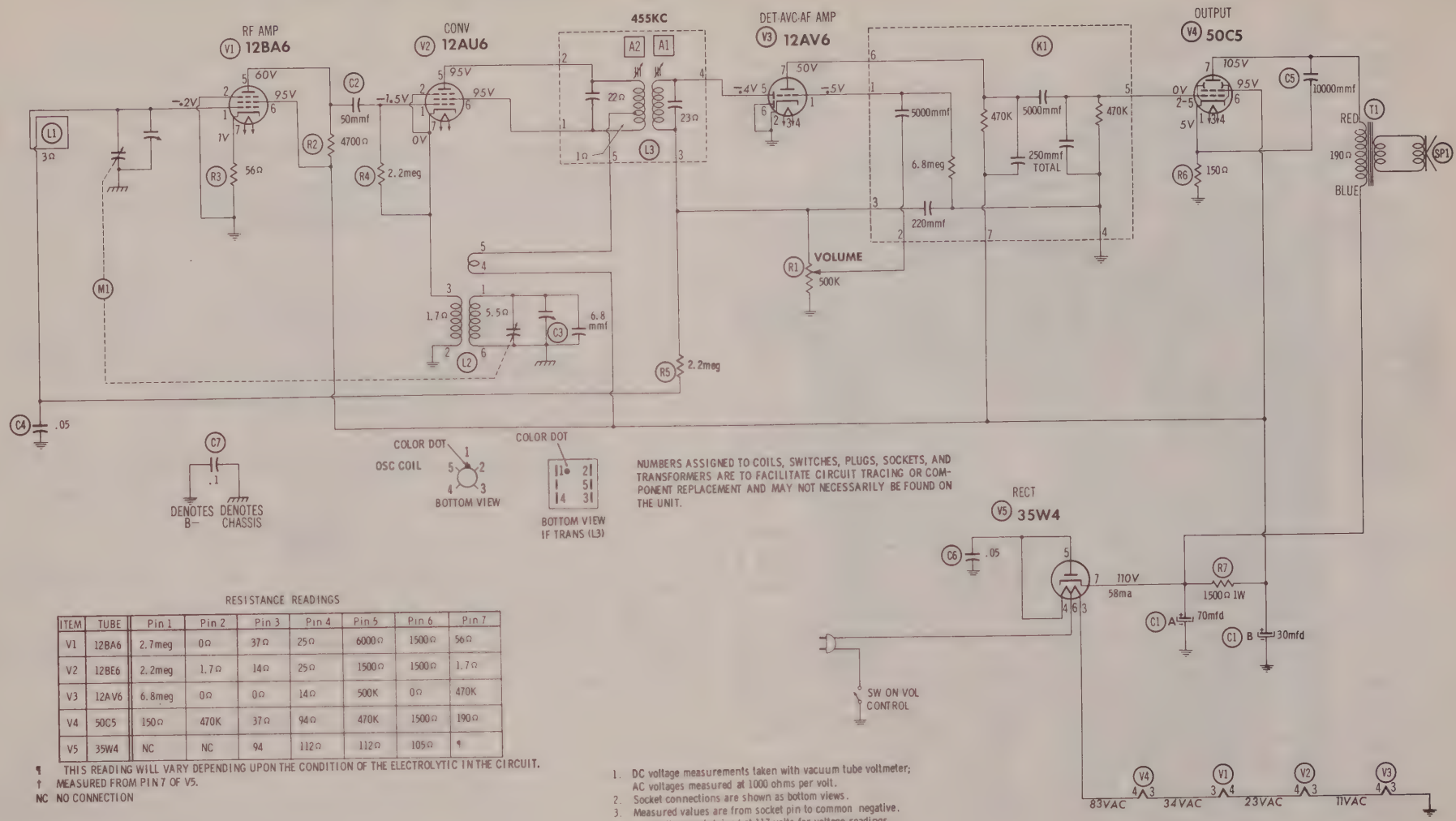
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—BOTTOM VIEW





NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	2.7meg	0Ω	37Ω	25Ω	6000Ω	1500Ω	56Ω
V2	12BE6	2.2meg	1.7Ω	14Ω	25Ω	1500Ω	1500Ω	1.7Ω
V3	12AV6	6.8meg	0Ω	0Ω	14Ω	500K	0Ω	470K
V4	50C5	150Ω	470K	37Ω	94Ω	470K	1500Ω	190Ω
V5	35W4	NC	NC	94	112Ω	112Ω	105Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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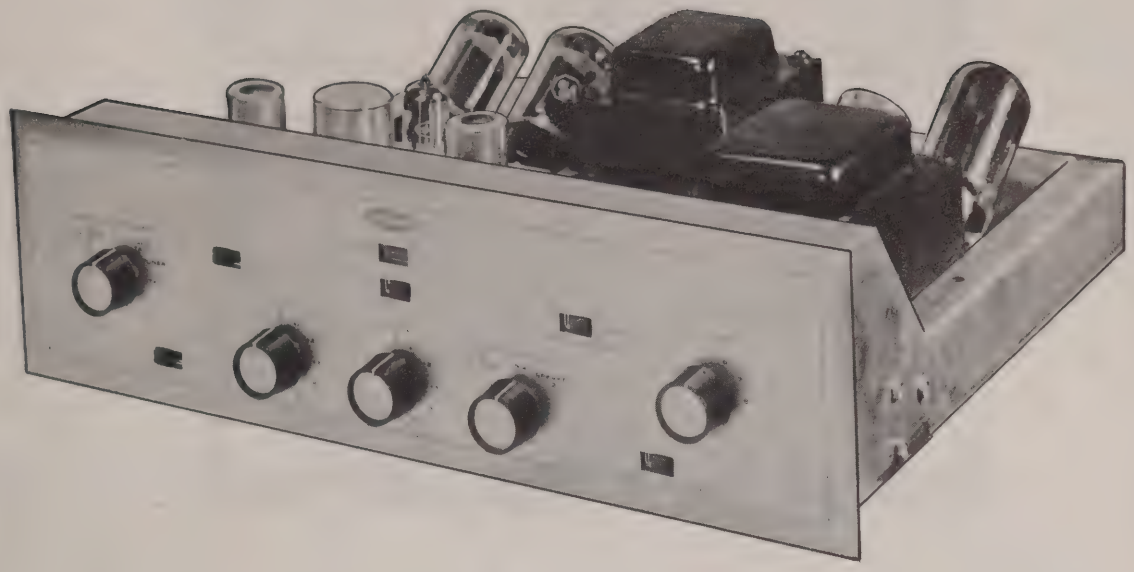
OLYMPIC MODELS 541, 550, 551

PHOTOFACT* Folder

H. H. SCOTT
MODEL 99-D

H. H. SCOTT
MODEL 99-D



H. H. SCOTT
MODEL 99-D

TRADE NAME	H. H. Scott Model 99-D
MANUFACTURER	Hermon Hosmer Scott, Inc., 111 Powder Mill Road, Maynard, Mass.
TYPE SET	AC Operated 6 Tube Audio Amplifier
POWER SUPPLY	105 - 125 Volts AC, 50-60 Cycles RATING 110 Watts, 1.05 Amp. @117 Volts AC

ADJUSTMENT

BALANCE ADJUSTMENT (R4)

Pre-set controls as follows:
Function Selector and Record Characteristic Switch to TV.
Rumble & Scratch Filters to Out.
Tape Monitor Switch to Record.
Bass and Treble to Zero (flat)
Speaker Switch to #1
Loudness to maximum (clockwise)
Loudness - Volume to Loudness

Connect 16Ω, 30W (minimum) resistor between speaker 16Ω and #1 terminal.

Connect AC voltmeter and scope across the resistor.

Connect the high side of audio generator to TV input, low side to chassis.

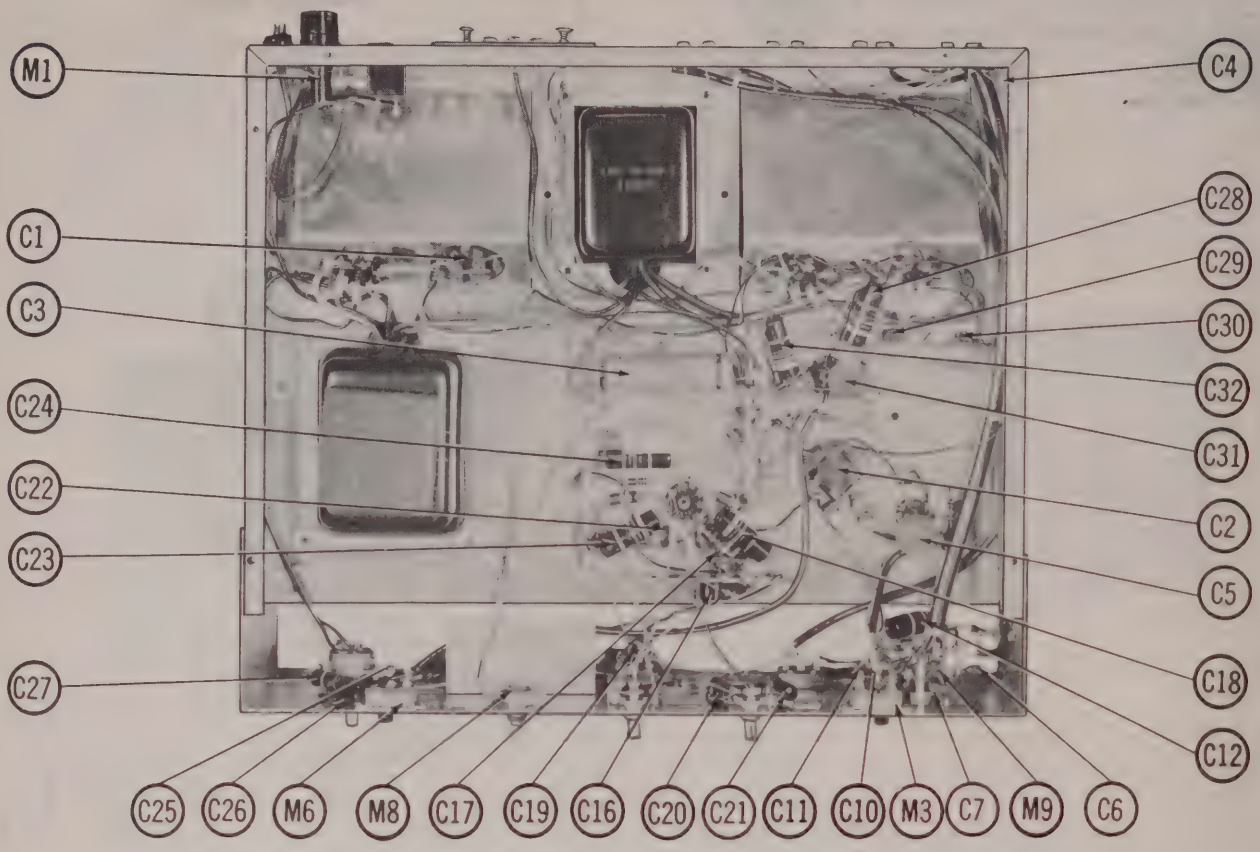
Set generator at 1000∿ with output between 0.4 to 0.7 volts.

Adjust input signal until the response is barely clipping, voltmeter reading not less than 17 volts.

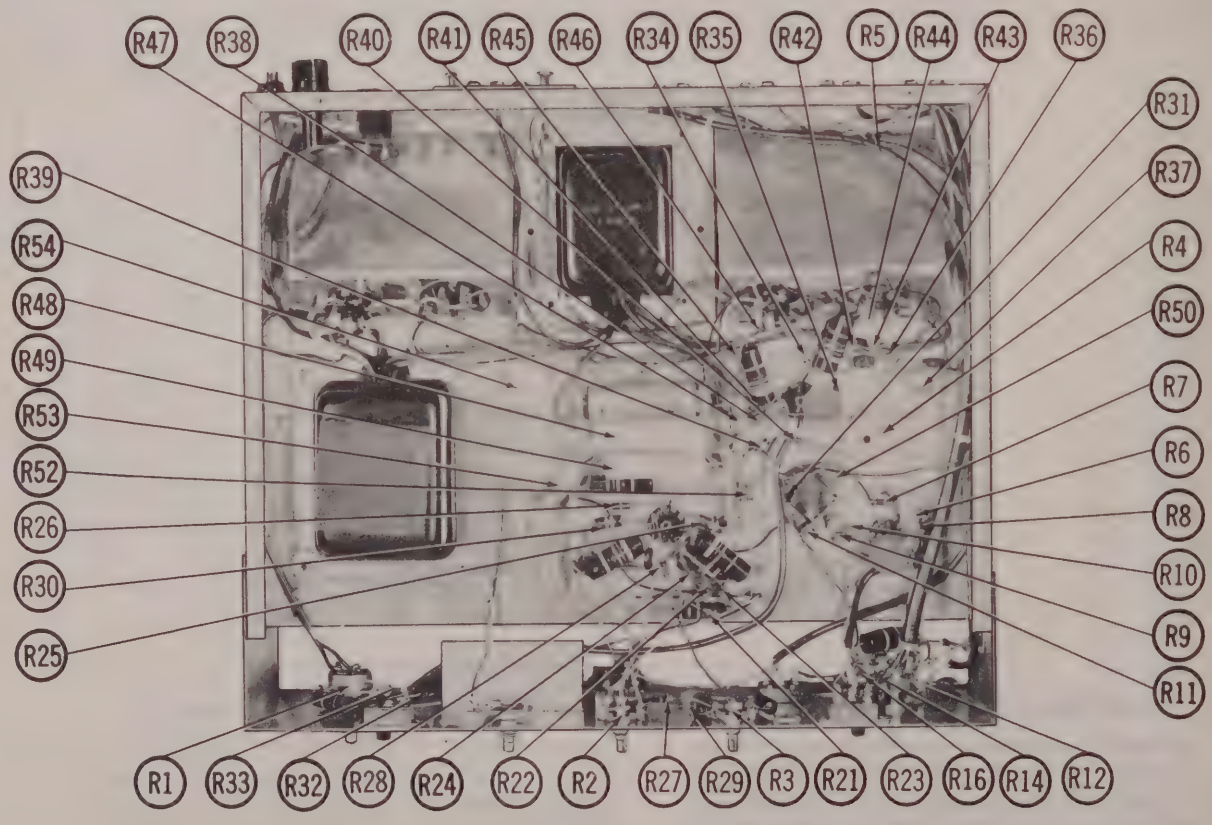
Adjust Balance R4 for symmetrical clipping response.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



CHASSIS BOTTOM VIEW - CAPACITOR & MISC IDENT.



CHASSIS BOTTOM VIEW - RESISTOR IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Mag. Preamplifier	12AX7	
V2	AF Amplifier	12AX7	
V3	AF Amp. -Phase Inv.	12AX7	
V4	Output	6L6GB	
V5	Output	6L6GB	
V6	Rectifier	5U4GA	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA H. H. SCOTT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲20	450	CEC-4X20-450	AFH4-14	D0130	FP444	TMQ-12	TVL-4763	
B	■20	450							
C	▲20	450							
D	20	450							
C2A	▲10	450	CEC-2X10-2X25	AFH4-63	D0504	FP376,6 TC26	TMQ-72	TVL-4711, 6	
B	■10	450							
C	▲25	25							
D	25	25							
C3	50	100	CET-50-100	PRS150V50	BR5015	TC49	TD-50-150	TVA-1414	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

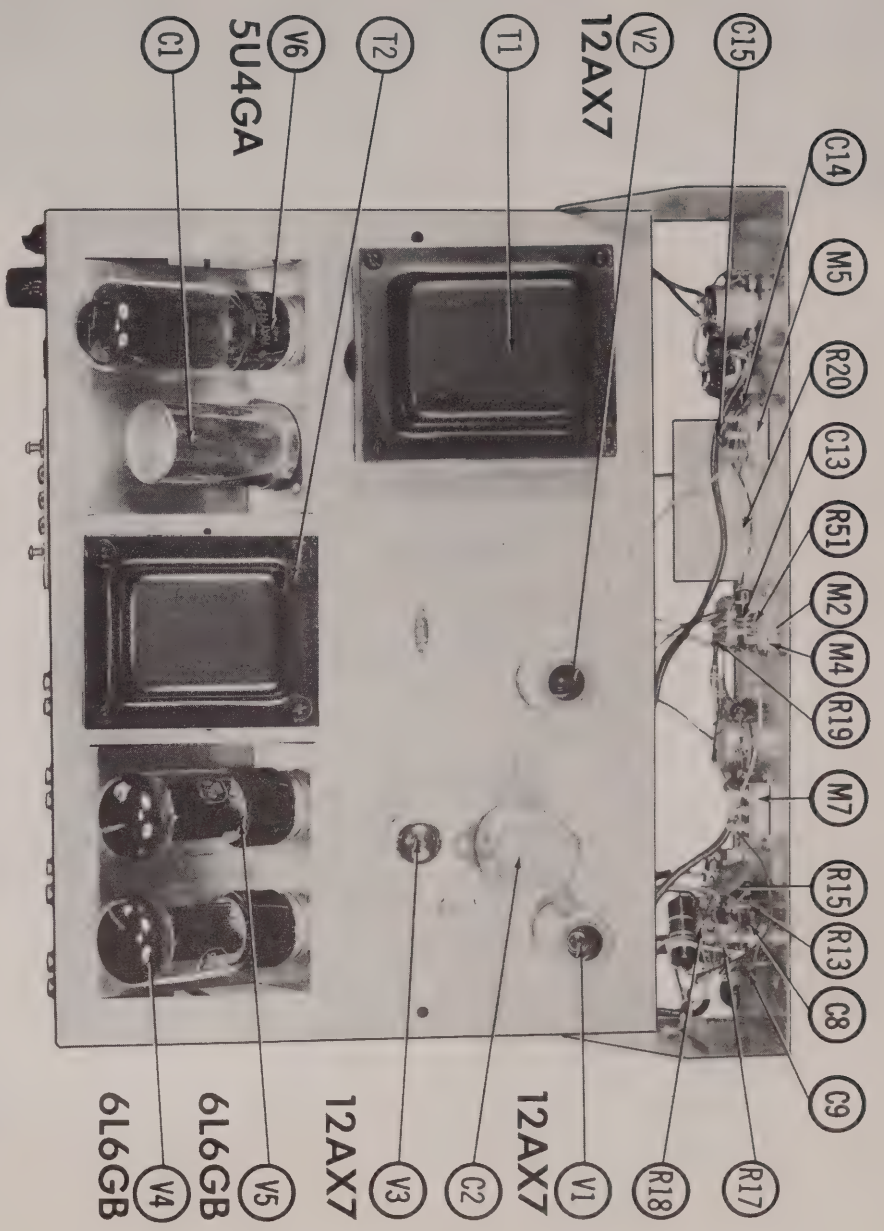
ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA H. H. SCOTT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	4700			CPM-.0047	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C5	20000			CPM-.02	BPD-02	DD-203	BYB6S2	B-120	5GA-S2	
C6	680		10%	CM20-680	1464-00068		1R5T68		MS-368	
C7	270		10%	CM15-220	1469-00027		5R5T27		MS-327	
C8	330		5%	CM15-330-20	1469-00033		5R5T33		MS-333	
C9	220		10%	CM15-220	1469-00022		22R5T22		MS-322	
C10	.0012	400		CPM-.0012	P488N-001	D6-122	CUB6D1	GEM-421	6TM-D1	
C11	20000			CPM-.02	BPD-02	DD-203	BYB6S1	B-120	5GA-S2	
C12	.047	400		CPM-.047	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C13	.0033	400		CPM-.0033	P488N-0033	D6-332	CUB6D33	GEM-6233	6TM-D33	
C14	62		5%	CM15-62-5	1469-000062		22R5Q62		MS-462	
C15	180		10%	CM15-180	1469-00018		22R5T18		MS-318	①
C16	.0015	400		CPM-.0015	P488N-0015	D6-152	CUB6D15	GEM-6215	6TM-D15	
C17	.0015	400		CPM-.0015	P488N-0015	D6-152	CUB6D15	GEM-6215	6TM-D15	
C18	.047	400		CPM-.047	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C19	220		10%	CM15-220	1469-00022		22R5T22		MS-322	
C20	.0068	400		CPM-.0068	P488N-0068	D6-682	CUB6D68	GEM-6268	6TM-D68	
C21	.0068	400		CPM-.0068	P488N-0068	D6-682	CUB6D68	GEM-6268	6TM-D68	
C22	47			CM15-47	1468-000047	D6-470	5W5Q47		1FM-447	
C23	.047	400		CPM-.047	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C24	.022	400		CPM-.022	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C25	47			CM15-47	1468-000047	D6-470	5W5Q47		1FM-447	
C26	.022	400		CPM-.022	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C27	.01	400		CPM-.01	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C28	.047	400		CPM-.047	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C29	330			CM15-330-20	1468-00033	D6-331	5W5T33		1FM-333	
C30	100			CM15-100	1468-0001	D6-101	5W5T1	MC-235	1FM-31	
C31	20000			CPM-.02	BPD-02	DD-203	BYA10Q47M	B-120	5GA-S2	
C32	.047	400		CPM-.047	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	

① Some versions may use 330mmf 5% in this application (Part #CM15-330-5).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA H. H. SCOTT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	1	RCV-500KTT	BT-160		Q18-133XX	UDT-283	Volume, Tap@120K & 300K
B	Switch		3FSW	KR-1		76-1	US-26	
R2A	1meg	1	RCV-1MT-3F	BT-71	A47F5-1meg	Q19-137X	UT-443	Treble, Tap@500K
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg	1	RCV-1MT-3F	BT-71	A47F5-1meg	Q19-137X	UT-443	Bass, Tap@500K
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	50K	1	RCV-50KL-3S	BX-31	A47-50K-S	Q11-123	U35	Balance
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	H. H. SCOTT PART No.	NOTES
R5	68K		RC21-68K	
R6	47K		RC21-47K	
R7	270K		RC21-270K	
R8	2700Ω		RC21-2.7K	
R9	1meg		RC21-1M	
R10	270K		RC21-270K	
R11	2700Ω		RC21-2.7K	
R12	1.2meg		RC21-1.2M	
R13	2.7meg		RC21-2.7M	
R14	270K		RC21-270K	
R15	4.7meg		RC21-4.7M	
R16	39K		RC21-39K	
R17	470K		RC21-470K	
R18	330K		RC21-330K	
R19	1meg		RC21-1M	
R20	470K		RC21-470K	
R21	3.9meg		RC21-3.9M	
R22	22meg		RC21-22M	
R23	2.2meg		RC21-2.2M	
R24	2.2meg		RC21-2.2M	
R25	100K	1	RC31-100K	
R26	1500Ω		RC21-1.5K	
R27	100K		RC21-100K	
R28	1meg		RC21-1M	
R29	100K		RC21-100K	
R30	100K	1	RC31-100K	

ITEM No.	RATING OHMS	RATING WATT	H. H. SCOTT PART No.	NOTES
R31	1500Ω		RC21-1.5K	
R32	47K		RC21-47K	
R33	100K		RC21-100K	
R34	100K		RC21-100K	
R35	220K		RC21-220K	
R36	1800Ω		RC21-1.8K	
R37	12K		RC21-12K	
R38	2.2meg		RC21-2.2M	
R39	100K		RC21-100K	
R40	270K		RC21-270K	
R41	1500Ω		RC21-1.5K	
R42	6800Ω		RC21-6.8K	
R43	330K		RC21-330K	
R44	1000Ω		RC21-1K	
R45	330K		RC21-330K	
R46	1000Ω		RC21-1K	
R47	3000Ω	4	RW4-3K	
R48	15K	15	RW15-15K	
R49	15K	15	RW15-15K	
R50	47K		RC21-47K	
R51	680K		RC21-680K	
R52	15K		RC21-15K	
R53	3000Ω	4	RW4-3K	
R54A	1500Ω	2		
B	160Ω	5	RWT-1693	
C	33Ω	4		

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA H. H. SCOTT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.05A	700 VCT @ .150A	5V @ 3A	TR-10-3-10						
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT @ 2.1A									

① Alternate Part #TR-10-3

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA H. H. SCOTT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7300Ω CT	16Ω Tap @ 8Ω, 4Ω	TRA-10-14-1①							① Alternate Part #TRA-10-14

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA H. H. SCOTT PART No. FUSE	H. H. SCOTT PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	2A 125V S/B			313002. (3AG 2A 125V) S/B	342012	MDL2	HKP-CC

MISCELLANEOUS

ITEM No.	PART NAME	H. H. SCOTT PART No.	NOTES
M2	Lamp	V-NE-2	NE-2
M3	Switch	SS-22	Pickup Selector (DPDT Slide Type)
M4	Switch	SS-22	Rumble Filter (DPDT, Slide Type)
M5	Switch	SS-22	Scratch Filter (DPDT, Slide Type)
M6	Switch	SS-22	Loudness-Volume (DPDT, Slide Type)
M7	Switch	SS-22	Tape Monitor (DPDT, Slide Type)
M8	Switch	SRW-13-6	Speaker Selector (DP3T, Rotary Wafer Type)
M9	Switch	SRW-59	Function Selector (Rotary Wafer Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob Front Panel	KN-R-8W N-99B-1	5 Used Includes Jewel

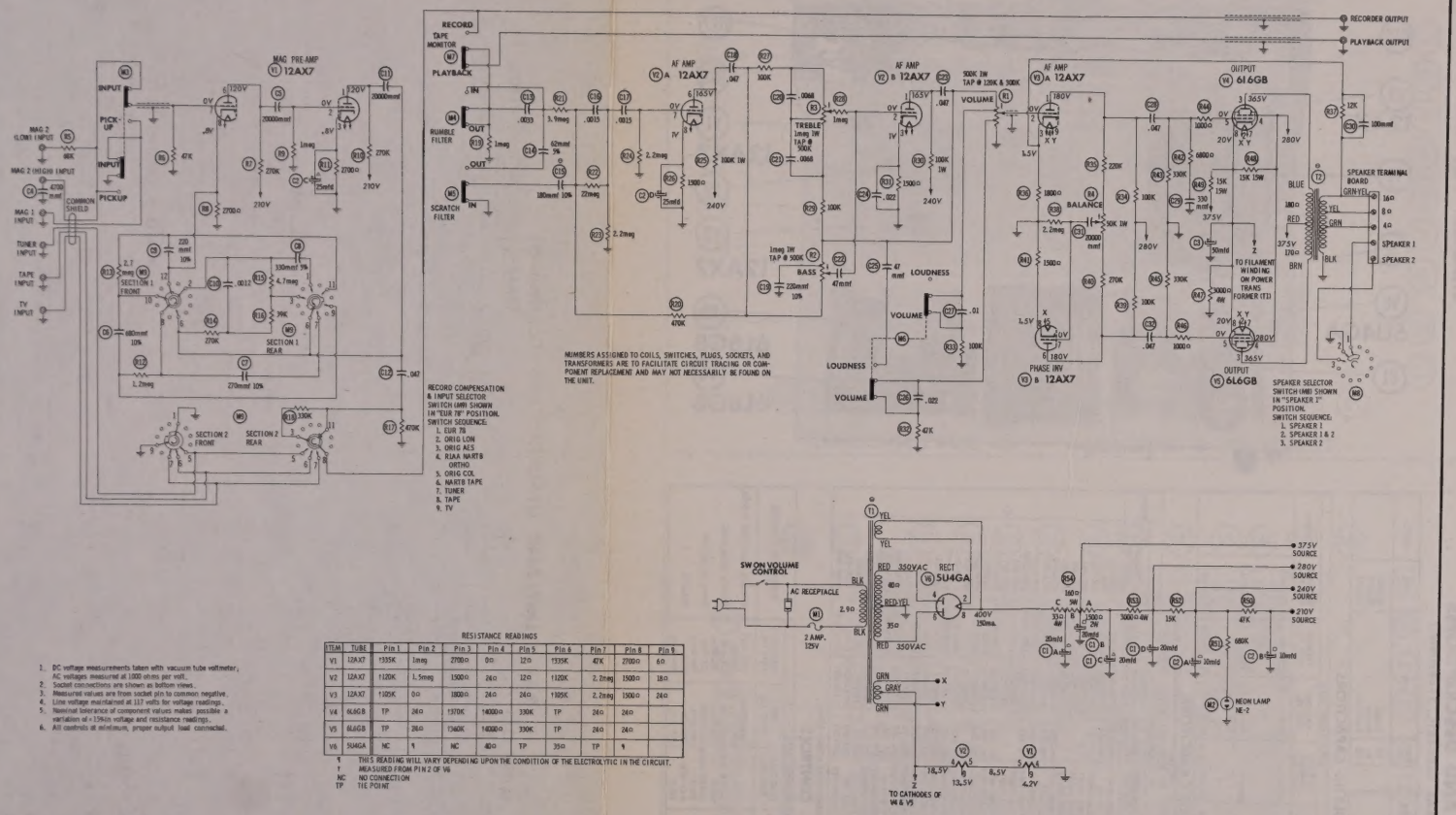
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RECORD COMPENSATION & INPUT SELECTOR SWITCH (M9) SHOWN IN "EUR 78" POSITION. SWITCH SEQUENCE:
1. EUR 78
2. ORIG LON
3. ORIG AES
4. RIAA NARTB ORTHO
5. ORIG COL
6. NARTB TAPE
7. TUNER
8. TAPE
9. TV

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

SPEAKER SELECTOR SWITCH (M8) SHOWN IN "SPEAKER 1" POSITION. SWITCH SEQUENCE:
1. SPEAKER 1
2. SPEAKER 1 & 2
3. SPEAKER 2

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	1335K	1meg	2700Ω	0Ω	12Ω	1335K	47K	2700Ω	6Ω
V2	12AX7	1120K	1.5meg	1500Ω	24Ω	12Ω	1120K	2.2meg	1500Ω	18Ω
V3	12AX7	1105K	0Ω	1800Ω	24Ω	24Ω	1105K	2.2meg	1500Ω	24Ω
V4	6L6GB	TP	24Ω	1370K	140000Ω	330K	TP	24Ω	24Ω	
V5	6L6GB	TP	24Ω	1360K	140000Ω	330K	TP	24Ω	24Ω	
V6	5U4GA	NC	¶	NC	40Ω	TP	35Ω	TP	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V6
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

PHOTOFACT STANDARD NOTATION SCHEMATIC
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H. H. SCOTT
MODEL 99-D